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BOILER MAKERS AND IRON SHIP BUILDERS COMPANION

T T F
Trades

THE

BOILERMAKERS'

AND

IRON SHIPBUILDERS' COMPANION:

COMPRISING A SERIES OF

ORIGINAL AND CAREFULLY CALCULATED TABLES

OF THE UTMOST UTILITY TO PERSONS INTERESTED IN THE IRON TRADES.

FOURTH EDITION.

BY JAMES FODEN,

AUTHOR OF 'MECHANICAL TABLES.'

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PREFACE.

In presenting this work to the practical Boilermakers and Iron Shipbuilders of Great Britain and Ireland, I hope they will study it with attention, to enable them to become acquainted with the elucidations of the practical examples which are given in the observations accompanying each section, as it is the result of my leisure hours, and has been accomplished by the aid of the lamp after the labours of the day, and is a humble effort to remove many difficulties under which they have laboured for the want of a more general knowledge of the practical part of their business.

The purport of the work is to impart knowledge to all those requiring it; because the value of mechanical science is most appreciated on account of the ease with which the workman can perform and lay out his work in a practical and scientific manner.

In the various rules and examples given in the work, I have taken care to present them in the most simple manner, so that there may be nothing discouraging by any unnecessary display of formulas. All may understand who are familiar with the four rules of arithmetic—Addition, Subtraction, Multiplication, and Division.

Some men, of contracted minds, think it unwise to impart a general knowledge of business to all—but I think otherwise. The practical man should be learned in all things relative to his trade, to enable him to do and nnish a piece of work in a business-like manner.

I have given in the work all the requirements for constructing templates for cylindrical boilers, consisting of conic frustrums, egg-end boilers, domes, barrels &c., and I hope that my humble efforts will be appreciated by those workmen who are employed in the construction of them.

In conclusion, let me remind the practical man that the science of mechanics is the greatest of all sciences; it teaches the mind to think correctly, and produces that intellectual enjoyment which no other study can impart.

JAMES FODEN.

Preface to the Second Edition.

The very favourable reception which the first edition of the Boilermakers' and Iron Shipbuilders' Companion has received has induced me to undertake an entire revisal of the work, in order to render it as complete and accurate as possible. The rules given in this edition, it is hoped, will prove invaluable to any person desirous of obtaining a thorough knowledge of his trade.

I am, with all respect,

Your servant,

JAMES FODEN.

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THE BOILER-MAKERS'

AND

IRON SHIP-BUILDERS' COMPANION.

SECTION I.

Tables for the formation of Circular and Oval Angled Iron Rings.

FLANGE OUTSIDE.

FIG. 1.

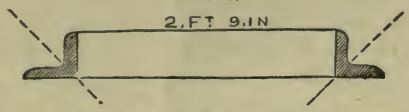


Figure 1 represents an angled iron ring, whose inside diameter is supposed to be 2 feet 9 inches, made of angled iron, measuring 1 inch thick diagonally across the root of the bar. In table 7, page 40, in the column of lengths, opposite the given diameter, is 9ft. 1⅞in, the length required for a ring of such dimensions.

EXAMPLES.—What length of angled iron, measuring ⅝ of an inch thick, diagonally across the root, is required to make a ring, the inside diameter being 2 feet? In table 4, page 22, opposite 2 feet, is 6 feet 7¼ inches, the length required.

What length of angled iron, which measures 1¼ inch thick, diagonally across the root of the bar, will make a ring, the inside diameter being 8 feet 6 inches? In table 9, page 56, opposite the given diameter, is 27 feet 4¼ inches, the length required.

To make an angled iron ring, in two equal parts, jump jointed, measuring ½ inch thick diagonally across the root of the bar, whose inside diameter is 6 feet 5 inches. To find the length

required for one of the parts: in table 3, page 19, opposite the given diameter, is 20 feet 5 inches, which, if divided by 2, gives 10 feet 2½ inches, the length required for one half the ring.

Fig. 2.

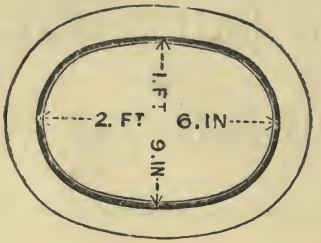


Figure 2 represents an oval ring, whose axis are 2 feet 6 inches and 1 foot 9 inches. To find the length for any size of such ring, reduce the two axis to a diameter, by adding them together, and divide their product by 2.

Example—What length of angled iron is required to form an oval ring whose axis are 2 feet 6 inches and 1 foot 9 inches, to be made of angled iron, measuring 1 inch diagonally across the root of the bar—

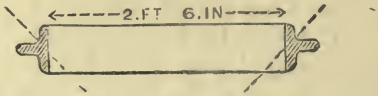
2 feet 6 inches.
1 ,, 9 ,,

2 | 4 ,, 3 ,,

2 ,, 1½ ,, the diameter required.

In table 7, page 40, opposite 2 feet 1½ inches, inside diameter, is 7 feet 2⅜ inches, the length required.

Fig. 3.



To make a ring as figure 3, whose inside diameter equals 2 feet 6 inches, to be formed of T iron, measuring 1 inch thick, diagonally across the root of the bar, what length is required for the ring? In table 7, page 40, opposite the given diameter, is 8 feet 4¼ inches, the length required.

TABLE I.,

For Angle Iron measuring $\frac{1}{4}$ of an Inch thick, diagonally across the root.

FLANGE OUTSIDE.

INSIDE DIAMETER OF RING.	LENGTH REQUIRED FOR RING.		INSIDE DIAMETER OF RING.	LENGTH REQUIRED FOR RING.		INSIDE DIAMETER OF RING.	LENGTH REQUIRED FOR RING.		INSIDE DIAMETER OF RING.	LENGTH REQUIRED FOR RING.	
IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.
6	1	8 3/8	0	10	2	9	1	2	3	9 1/2	1	6	4	10 1/8
6 1/8	1	8 3/4	0	10 1/8	2	9 3/8	1	2 1/8	3	9 7/8	1	6 1/8	4	10 1/2
6 1/4	1	9 1/8	0	10 1/4	2	9 3/4	1	2 1/4	3	10 3/8	1	6 1/4	4	10 7/8
6 3/8	1	9 1/2	0	10 3/8	2	10 1/8	1	2 3/8	3	10 3/4	1	6 3/8	4	11 1/4
6 1/2	1	10	0	10 1/2	2	10 1/2	1	2 1/2	3	11 1/8	1	6 1/2	4	11 5/8
6 5/8	1	10 3/8	0	10 5/8	2	10 7/8	1	2 5/8	3	11 1/2	1	6 5/8	5	0
6 3/4	1	10 3/4	0	10 3/4	2	11 3/8	1	2 3/4	3	11 7/8	1	6 3/4	5	0 3/8
6 7/8	1	11 1/8	0	10 7/8	2	11 3/4	1	2 7/8	4	0 1/4	1	6 7/8	5	0 7/8
7	1	11 1/2	0	11	3	0 1/8	1	3	4	0 5/8	1	7	5	1 1/4
7 1/8	1	11 7/8	0	11 1/8	3	0 1/2	1	3 1/8	4	1	1	7 1/8	5	1 5/8
7 1/4	2	0 3/8	0	11 1/4	3	0 7/8	1	3 1/4	4	1 3/8	1	7 1/4	5	2
7 3/8	2	0 3/4	0	11 3/8	3	1 1/4	1	3 3/8	4	1 7/8	1	7 3/8	5	2 3/8
7 1/2	2	1 1/8	0	11 1/2	3	1 5/8	1	3 1/2	4	2 1/4	1	7 1/2	5	2 3/4
7 5/8	2	1 1/2	0	11 5/8	3	2	1	3 5/8	4	2 5/8	1	7 5/8	5	3 1/8
7 3/4	2	1 7/8	0	11 3/4	3	2 1/2	1	3 3/4	4	3	1	7 3/4	5	3 5/8
7 7/8	2	2 3/8	0	11 7/8	3	2 7/8	1	3 7/8	4	3 3/8	1	7 7/8	5	4
8	2	2 3/4	1	0	3	3 1/4	1	4	4	3 3/4	1	8	5	4 3/8
8 1/8	2	3 1/8	1	0 1/8	3	3 5/8	1	4 1/8	4	4 1/8	1	8 1/8	5	4 3/4
8 1/4	2	3 1/2	1	0 1/4	3	4	1	4 1/4	4	4 1/2	1	8 1/4	5	5 1/8
8 3/8	2	3 7/8	1	0 3/8	3	4 3/8	1	4 3/8	4	5	1	8 3/8	5	5 1/2
8 1/2	2	4 1/4	1	0 1/2	3	4 7/8	1	4 1/2	4	5 3/8	1	8 1/2	5	5 7/8
8 5/8	2	4 5/8	1	0 5/8	3	5 1/4	1	4 5/8	4	5 3/4	1	8 5/8	5	6 3/8
8 3/4	2	5	1	0 3/4	3	5 5/8	1	4 3/4	4	6 1/8	1	8 3/4	5	6 3/4
8 7/8	2	5 1/2	1	0 7/8	3	6	1	4 7/8	4	6 1/2	1	8 7/8	5	7 1/8
9	2	5 7/8	1	1	3	6 3/8	1	5	4	7	1	9	5	7 1/2
9 1/8	2	6 1/4	1	1 1/8	3	6 3/4	1	5 1/8	4	7 3/8	1	9 1/8	5	8
9 1/4	2	6 5/8	1	1 1/4	3	7 1/8	1	5 1/4	4	7 3/4	1	9 1/4	5	8 3/8
9 3/8	2	7	1	1 3/8	3	7 5/8	1	5 3/8	4	8 1/8	1	9 3/8	5	8 3/4
9 1/2	2	7 3/8	1	1 1/2	3	8	1	5 1/2	4	8 1/2	1	9 1/2	5	9 1/8
9 5/8	2	7 3/4	1	1 5/8	3	8 3/8	1	5 5/8	4	8 7/8	1	9 5/8	5	9 1/2
9 3/4	2	8 1/4	1	1 3/4	3	8 3/4	1	5 3/4	4	9 1/4	1	9 3/4	5	9 7/8
9 7/8	2	8 5/8	1	1 7/8	3	9 1/8	1	5 7/8	4	9 5/8	1	9 7/8	5	10 1/4

For Angle Iron measuring $\frac{1}{4}$ of an Inch thick, diagonally across the root.

FLANGE OUTSIDE.

INSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.		INSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.		INSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.		INSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.	
FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.
1	10	5	$10\frac{5}{8}$	2	2	6	$11\frac{1}{4}$	2	6	7	$11\frac{3}{4}$	2	10	9	$0\frac{3}{8}$
1	$10\frac{1}{8}$	5	11	2	$2\frac{1}{8}$	6	$11\frac{5}{8}$	2	$6\frac{1}{8}$	8	$0\frac{1}{8}$	2	$10\frac{1}{8}$	9	$0\frac{3}{4}$
1	$10\frac{1}{4}$	5	$11\frac{1}{2}$	2	$2\frac{1}{4}$	7	0	2	$6\frac{1}{4}$	8	$0\frac{1}{2}$	2	$10\frac{1}{4}$	9	$1\frac{1}{8}$
1	$10\frac{3}{8}$	6	$0\frac{7}{8}$	2	$2\frac{3}{8}$	7	$0\frac{3}{8}$	2	$6\frac{3}{8}$	8	1	2	$10\frac{3}{8}$	9	$1\frac{1}{2}$
1	$10\frac{1}{2}$	6	$0\frac{1}{4}$	2	$2\frac{1}{2}$	7	$0\frac{3}{4}$	2	$6\frac{1}{2}$	8	$1\frac{3}{8}$	2	$10\frac{1}{2}$	9	$1\frac{7}{8}$
1	$10\frac{5}{8}$	6	$0\frac{5}{8}$	2	$2\frac{5}{8}$	7	$1\frac{1}{8}$	2	$6\frac{5}{8}$	8	$1\frac{3}{4}$	2	$10\frac{5}{8}$	9	$2\frac{3}{8}$
1	$10\frac{3}{4}$	6	1	2	$2\frac{3}{4}$	7	$1\frac{1}{2}$	2	$6\frac{3}{4}$	8	$2\frac{1}{8}$	2	$10\frac{3}{4}$	9	$2\frac{3}{4}$
1	$10\frac{7}{8}$	6	$1\frac{3}{8}$	2	$2\frac{7}{8}$	7	2	2	$6\frac{7}{8}$	8	$2\frac{1}{2}$	2	$10\frac{7}{8}$	9	$3\frac{1}{8}$
1	11	6	$1\frac{3}{4}$	2	3	7	$2\frac{3}{8}$	2	7	8	$2\frac{7}{8}$	2	11	9	$3\frac{1}{2}$
1	$11\frac{1}{8}$	6	$2\frac{1}{8}$	2	$3\frac{1}{8}$	7	$2\frac{3}{4}$	2	$7\frac{1}{8}$	8	$3\frac{3}{8}$	2	$11\frac{1}{8}$	9	$3\frac{7}{8}$
1	$11\frac{1}{4}$	6	$2\frac{5}{8}$	2	$3\frac{1}{4}$	7	$3\frac{1}{8}$	2	$7\frac{1}{4}$	8	$3\frac{3}{4}$	2	$11\frac{1}{4}$	9	$4\frac{1}{4}$
1	$11\frac{3}{8}$	6	3	2	$3\frac{3}{8}$	7	$3\frac{1}{2}$	2	$7\frac{3}{8}$	8	$4\frac{1}{8}$	2	$11\frac{3}{8}$	9	$4\frac{5}{8}$
1	$11\frac{1}{2}$	6	$3\frac{3}{8}$	2	$3\frac{1}{2}$	7	$3\frac{7}{8}$	2	$7\frac{1}{2}$	8	$4\frac{1}{2}$	2	$11\frac{1}{2}$	9	5
1	$11\frac{5}{8}$	6	$3\frac{3}{4}$	2	$3\frac{5}{8}$	7	$4\frac{3}{8}$	2	$7\frac{5}{8}$	8	$4\frac{7}{8}$	2	$11\frac{5}{8}$	9	$5\frac{1}{2}$
1	$11\frac{3}{4}$	6	$4\frac{1}{8}$	2	$3\frac{3}{4}$	7	$4\frac{3}{4}$	2	$7\frac{3}{4}$	8	$5\frac{1}{4}$	2	$11\frac{3}{4}$	9	$5\frac{7}{8}$
1	$11\frac{7}{8}$	6	$4\frac{1}{2}$	2	$3\frac{7}{8}$	7	$5\frac{1}{8}$	2	$7\frac{7}{8}$	8	$5\frac{5}{8}$	2	$11\frac{7}{8}$	9	$6\frac{1}{4}$
2	0	6	$4\frac{7}{8}$	2	4	7	$5\frac{1}{2}$	2	8	8	6	3	0	9	$6\frac{5}{8}$
2	$0\frac{1}{8}$	6	$5\frac{3}{8}$	2	$4\frac{1}{8}$	7	$5\frac{7}{8}$	2	$8\frac{1}{8}$	8	$6\frac{1}{2}$	3	$0\frac{1}{8}$	9	7
2	$0\frac{1}{4}$	6	$5\frac{3}{4}$	2	$4\frac{1}{4}$	7	$6\frac{1}{4}$	2	$8\frac{1}{4}$	8	$6\frac{7}{8}$	3	$0\frac{1}{4}$	9	$7\frac{3}{8}$
2	$0\frac{3}{8}$	6	$6\frac{1}{8}$	2	$4\frac{3}{8}$	7	$6\frac{5}{8}$	2	$8\frac{3}{8}$	8	$7\frac{1}{4}$	3	$0\frac{3}{8}$	9	$7\frac{7}{8}$
2	$0\frac{1}{2}$	6	$6\frac{1}{2}$	2	$4\frac{1}{2}$	7	7	2	$8\frac{1}{2}$	8	$7\frac{5}{8}$	3	$0\frac{1}{2}$	9	$8\frac{1}{4}$
2	$0\frac{5}{8}$	6	$6\frac{7}{8}$	2	$4\frac{5}{8}$	7	$7\frac{1}{2}$	2	$8\frac{5}{8}$	8	8	3	$0\frac{5}{8}$	9	$8\frac{5}{8}$
2	$0\frac{3}{4}$	6	$7\frac{1}{4}$	2	$4\frac{3}{4}$	7	$7\frac{7}{8}$	2	$8\frac{3}{4}$	8	$8\frac{3}{8}$	3	$0\frac{3}{4}$	9	9
2	$0\frac{7}{8}$	6	$7\frac{5}{8}$	2	$4\frac{7}{8}$	7	$8\frac{1}{4}$	2	$8\frac{7}{8}$	8	$8\frac{7}{8}$	3	$0\frac{7}{8}$	9	$9\frac{3}{8}$
2	1	6	$8\frac{1}{8}$	2	5	7	$8\frac{5}{8}$	2	9	8	$9\frac{1}{4}$	3	1	9	$9\frac{3}{4}$
2	$1\frac{1}{8}$	6	$8\frac{1}{2}$	2	$5\frac{1}{8}$	7	9	2	$9\frac{1}{8}$	8	$9\frac{5}{8}$	3	$1\frac{1}{8}$	9	$10\frac{1}{8}$
2	$1\frac{1}{4}$	6	$8\frac{7}{8}$	2	$5\frac{1}{4}$	7	$9\frac{3}{8}$	2	$9\frac{1}{4}$	8	10	3	$1\frac{1}{4}$	9	$10\frac{1}{2}$
2	$1\frac{3}{8}$	6	$9\frac{1}{4}$	2	$5\frac{3}{8}$	7	$9\frac{3}{4}$	2	$9\frac{3}{8}$	8	$10\frac{3}{8}$	3	$1\frac{3}{8}$	9	$10\frac{7}{8}$
2	$1\frac{1}{2}$	6	$9\frac{5}{8}$	2	$5\frac{1}{2}$	7	$10\frac{1}{4}$	2	$9\frac{1}{2}$	8	$10\frac{3}{4}$	3	$1\frac{1}{2}$	9	$11\frac{3}{8}$
2	$1\frac{5}{8}$	6	10	2	$5\frac{5}{8}$	7	$10\frac{5}{8}$	2	$9\frac{5}{8}$	8	$11\frac{1}{8}$	3	$1\frac{5}{8}$	9	$11\frac{3}{4}$
2	$1\frac{3}{4}$	6	$10\frac{1}{2}$	2	$5\frac{3}{4}$	7	11	2	$9\frac{3}{4}$	8	$11\frac{1}{2}$	3	$1\frac{3}{4}$	10	$0\frac{1}{8}$
2	$1\frac{7}{8}$	6	$10\frac{7}{8}$	2	$5\frac{7}{8}$	7	$11\frac{3}{8}$	2	$9\frac{7}{8}$	9	0	3	$1\frac{7}{8}$	10	$0\frac{1}{2}$

For Angle Iron measuring $\frac{1}{4}$ of an Inch thick, diagonally across the root.

FLANGE OUTSIDE.

INSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.		INSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.		INSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.		INSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.	
FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.
3	2	10	$0\frac{7}{8}$	3	6	11	$1\frac{1}{2}$	3	10	12	2	4	2	13	$2\frac{5}{8}$
3	$2\frac{1}{8}$	10	$1\frac{3}{8}$	3	$6\frac{1}{8}$	11	$1\frac{7}{8}$	3	$10\frac{1}{8}$	12	$2\frac{3}{8}$	4	$2\frac{1}{8}$	13	3
3	$2\frac{1}{4}$	10	$1\frac{3}{4}$	3	$6\frac{1}{4}$	11	$2\frac{1}{4}$	3	$10\frac{1}{4}$	12	$2\frac{7}{8}$	4	$2\frac{1}{4}$	13	$3\frac{3}{8}$
3	$2\frac{3}{8}$	10	$2\frac{1}{8}$	3	$6\frac{3}{8}$	11	$2\frac{5}{8}$	3	$10\frac{3}{8}$	12	$3\frac{1}{4}$	4	$2\frac{3}{8}$	13	$3\frac{3}{4}$
3	$2\frac{1}{2}$	10	$2\frac{1}{2}$	3	$6\frac{1}{2}$	11	3	3	$10\frac{1}{2}$	12	$3\frac{5}{8}$	4	$2\frac{1}{2}$	13	$4\frac{1}{4}$
3	$2\frac{5}{8}$	10	$2\frac{7}{8}$	3	$6\frac{5}{8}$	11	$3\frac{1}{2}$	3	$10\frac{5}{8}$	12	4	4	$2\frac{5}{8}$	13	$4\frac{5}{8}$
3	$2\frac{3}{4}$	10	$3\frac{1}{4}$	3	$6\frac{3}{4}$	11	$3\frac{7}{8}$	3	$10\frac{3}{4}$	12	$4\frac{3}{8}$	4	$2\frac{3}{4}$	13	5
3	$2\frac{7}{8}$	10	$3\frac{3}{8}$	3	$6\frac{7}{8}$	11	$4\frac{1}{4}$	3	$10\frac{7}{8}$	12	$4\frac{3}{4}$	4	$2\frac{7}{8}$	13	$5\frac{3}{8}$
3	3	10	4	3	7	11	$4\frac{5}{8}$	3	11	12	$5\frac{1}{4}$	4	3	13	$5\frac{3}{4}$
3	$3\frac{1}{8}$	10	$4\frac{1}{2}$	3	$7\frac{1}{8}$	11	5	3	$11\frac{1}{8}$	12	$5\frac{5}{8}$	4	$3\frac{1}{8}$	13	$6\frac{1}{8}$
3	$3\frac{1}{4}$	10	$4\frac{7}{8}$	3	$7\frac{1}{4}$	11	$5\frac{3}{8}$	3	$11\frac{1}{4}$	12	6	4	$3\frac{1}{4}$	13	$6\frac{1}{2}$
3	$3\frac{3}{8}$	10	$5\frac{1}{4}$	3	$7\frac{3}{8}$	11	$5\frac{3}{4}$	3	$11\frac{3}{8}$	12	$6\frac{3}{8}$	4	$3\frac{3}{8}$	13	7
3	$3\frac{1}{2}$	10	$5\frac{5}{8}$	3	$7\frac{1}{2}$	11	$6\frac{1}{4}$	3	$11\frac{1}{2}$	12	$6\frac{3}{4}$	4	$3\frac{1}{2}$	13	$7\frac{3}{8}$
3	$3\frac{5}{8}$	10	6	3	$7\frac{5}{8}$	11	$6\frac{5}{8}$	3	$11\frac{5}{8}$	12	$7\frac{1}{8}$	4	$3\frac{5}{8}$	13	$7\frac{3}{4}$
3	$3\frac{3}{4}$	10	$6\frac{3}{8}$	3	$7\frac{3}{4}$	11	7	3	$11\frac{3}{4}$	12	$7\frac{1}{2}$	4	$3\frac{3}{4}$	13	$8\frac{1}{8}$
3	$3\frac{7}{8}$	10	$6\frac{7}{8}$	3	$7\frac{7}{8}$	11	$7\frac{3}{8}$	3	$11\frac{7}{8}$	12	$7\frac{7}{8}$	4	$3\frac{7}{8}$	13	$8\frac{1}{2}$
3	4	10	$7\frac{1}{4}$	3	8	11	$7\frac{3}{4}$	4	0	12	$8\frac{3}{8}$	4	4	13	$8\frac{7}{8}$
3	$4\frac{1}{8}$	10	$7\frac{5}{8}$	3	$8\frac{1}{8}$	11	$8\frac{1}{8}$	4	$0\frac{1}{8}$	12	$8\frac{3}{4}$	4	$4\frac{1}{8}$	13	$9\frac{1}{4}$
3	$4\frac{1}{4}$	10	8	3	$8\frac{1}{4}$	11	$8\frac{1}{2}$	4	$0\frac{1}{4}$	12	$9\frac{1}{8}$	4	$4\frac{1}{4}$	13	$9\frac{5}{8}$
3	$4\frac{3}{8}$	10	$8\frac{3}{8}$	3	$8\frac{3}{8}$	11	$8\frac{7}{8}$	4	$0\frac{3}{8}$	12	$9\frac{1}{2}$	4	$4\frac{3}{8}$	13	$10\frac{1}{8}$
3	$4\frac{1}{2}$	10	$8\frac{3}{4}$	3	$8\frac{1}{2}$	11	$9\frac{3}{8}$	4	$0\frac{1}{2}$	12	$9\frac{7}{8}$	4	$4\frac{1}{2}$	13	$10\frac{1}{2}$
3	$4\frac{5}{8}$	10	$9\frac{1}{8}$	3	$8\frac{5}{8}$	11	$9\frac{3}{4}$	4	$0\frac{5}{8}$	12	$10\frac{3}{8}$	4	$4\frac{5}{8}$	13	$10\frac{7}{8}$
3	$4\frac{3}{4}$	10	$9\frac{1}{2}$	3	$8\frac{3}{4}$	11	$10\frac{1}{8}$	4	$0\frac{3}{4}$	12	$10\frac{3}{4}$	4	$4\frac{3}{4}$	13	$11\frac{1}{4}$
3	$4\frac{7}{8}$	10	$9\frac{7}{8}$	3	$8\frac{7}{8}$	11	$10\frac{1}{2}$	4	$0\frac{7}{8}$	12	$11\frac{1}{8}$	4	$4\frac{7}{8}$	13	$11\frac{5}{8}$
3	5	10	$10\frac{3}{8}$	3	9	11	$10\frac{7}{8}$	4	1	12	$11\frac{1}{2}$	4	5	14	0
3	$5\frac{1}{8}$	10	$10\frac{3}{4}$	3	$9\frac{1}{8}$	11	$11\frac{1}{4}$	4	$1\frac{1}{8}$	12	$11\frac{7}{8}$	4	$5\frac{1}{8}$	14	$0\frac{3}{8}$
3	$5\frac{1}{4}$	10	$11\frac{1}{8}$	3	$9\frac{1}{4}$	11	$11\frac{5}{8}$	4	$1\frac{1}{4}$	13	$0\frac{1}{4}$	4	$5\frac{1}{4}$	14	$0\frac{7}{8}$
3	$5\frac{3}{8}$	10	$11\frac{1}{2}$	3	$9\frac{3}{8}$	12	$0\frac{1}{8}$	4	$1\frac{3}{8}$	13	$0\frac{5}{8}$	4	$5\frac{3}{8}$	14	$1\frac{1}{4}$
3	$5\frac{1}{2}$	10	$11\frac{7}{8}$	3	$9\frac{1}{2}$	12	$0\frac{1}{2}$	4	$1\frac{1}{2}$	13	1	4	$5\frac{1}{2}$	14	$1\frac{5}{8}$
3	$5\frac{5}{8}$	11	$0\frac{3}{8}$	3	$9\frac{5}{8}$	12	$0\frac{7}{8}$	4	$1\frac{5}{8}$	13	$1\frac{1}{2}$	4	$5\frac{5}{8}$	14	2
3	$5\frac{3}{4}$	11	$0\frac{3}{4}$	3	$9\frac{3}{4}$	12	$1\frac{1}{4}$	4	$1\frac{3}{4}$	13	$1\frac{7}{8}$	4	$5\frac{3}{4}$	14	$2\frac{3}{8}$
3	$5\frac{7}{8}$	11	$1\frac{1}{8}$	3	$9\frac{7}{8}$	12	$1\frac{5}{8}$	4	$1\frac{7}{8}$	13	$2\frac{1}{4}$	4	$5\frac{7}{8}$	14	$2\frac{3}{4}$

For Angle Iron measuring $\frac{1}{4}$ of an Inch thick, diagonally across the root.

FLANGE OUTSIDE.

Inside Diameter of Ring.		Length Required for Ring.		Inside Diameter of Ring.		Length Required for Ring.		Inside Diameter of Ring.		Length Required for Ring.		Inside Diameter of Ring.		Length Required for Ring.	
Ft.	In.	Ft.	In.	Ft.	In.	Ft.	In.	Ft.	In.	Ft.	In.	Ft.	In.	Ft.	In.
4	6	14	$3\frac{1}{8}$	4	10	15	$3\frac{3}{4}$	5	2	16	$4\frac{3}{8}$	5	6	17	$4\frac{7}{8}$
4	$6\frac{1}{8}$	14	$3\frac{1}{2}$	4	$10\frac{1}{8}$	15	$4\frac{1}{8}$	5	$2\frac{1}{8}$	16	$4\frac{3}{4}$	5	$6\frac{1}{8}$	17	$5\frac{1}{4}$
4	$6\frac{1}{4}$	14	4	4	$10\frac{1}{4}$	15	$4\frac{1}{2}$	5	$2\frac{1}{4}$	16	$5\frac{1}{8}$	5	$6\frac{1}{4}$	17	$5\frac{5}{8}$
4	$6\frac{3}{8}$	14	$4\frac{3}{8}$	4	$10\frac{3}{8}$	15	$4\frac{7}{8}$	5	$2\frac{3}{8}$	16	$5\frac{1}{2}$	5	$6\frac{3}{8}$	17	6
4	$6\frac{1}{2}$	14	$4\frac{3}{4}$	4	$10\frac{1}{2}$	15	$5\frac{3}{8}$	5	$2\frac{1}{2}$	16	$5\frac{7}{8}$	5	$6\frac{1}{2}$	17	$6\frac{1}{2}$
4	$6\frac{5}{8}$	14	$5\frac{1}{8}$	4	$10\frac{5}{8}$	15	$5\frac{3}{4}$	5	$2\frac{5}{8}$	16	$6\frac{1}{4}$	5	$6\frac{5}{8}$	17	$6\frac{7}{8}$
4	$6\frac{3}{4}$	14	$5\frac{1}{2}$	4	$10\frac{3}{4}$	15	$6\frac{1}{8}$	5	$2\frac{3}{4}$	16	$6\frac{5}{8}$	5	$6\frac{3}{4}$	17	$7\frac{1}{4}$
4	$6\frac{7}{8}$	14	$5\frac{7}{8}$	4	$10\frac{7}{8}$	15	$6\frac{1}{2}$	5	$2\frac{7}{8}$	16	7	5	$6\frac{7}{8}$	17	$7\frac{5}{8}$
4	7	14	$6\frac{3}{8}$	4	11	15	$6\frac{7}{8}$	5	3	16	$7\frac{1}{2}$	5	7	17	8
4	$7\frac{1}{8}$	14	$6\frac{3}{4}$	4	$11\frac{1}{8}$	15	$7\frac{1}{4}$	5	$3\frac{1}{8}$	16	$7\frac{7}{8}$	5	$7\frac{1}{8}$	17	$8\frac{3}{8}$
4	$7\frac{1}{4}$	14	$7\frac{1}{8}$	4	$11\frac{1}{4}$	15	$7\frac{3}{4}$	5	$3\frac{1}{4}$	16	$8\frac{1}{4}$	5	$7\frac{1}{4}$	17	$8\frac{7}{8}$
4	$7\frac{3}{8}$	14	$7\frac{1}{2}$	4	$11\frac{3}{8}$	15	$8\frac{1}{8}$	5	$3\frac{3}{8}$	16	$8\frac{5}{8}$	5	$7\frac{3}{8}$	17	$9\frac{1}{4}$
4	$7\frac{1}{2}$	14	$7\frac{7}{8}$	4	$11\frac{1}{2}$	15	$8\frac{1}{2}$	5	$3\frac{1}{2}$	16	9	5	$7\frac{1}{2}$	17	$9\frac{5}{8}$
4	$7\frac{5}{8}$	14	$8\frac{1}{4}$	4	$11\frac{5}{8}$	15	$8\frac{7}{8}$	5	$3\frac{5}{8}$	16	$9\frac{3}{8}$	5	$7\frac{5}{8}$	17	10
4	$7\frac{3}{4}$	14	$8\frac{3}{4}$	4	$11\frac{3}{4}$	15	$9\frac{1}{4}$	5	$3\frac{3}{4}$	16	$9\frac{7}{8}$	5	$7\frac{3}{4}$	17	$10\frac{3}{8}$
4	$7\frac{7}{8}$	14	$9\frac{1}{8}$	4	$11\frac{7}{8}$	15	$9\frac{5}{8}$	5	$3\frac{7}{8}$	16	$10\frac{1}{4}$	5	$7\frac{7}{8}$	17	$10\frac{3}{4}$
4	8	14	$9\frac{1}{2}$	5	0	15	10	5	4	16	$10\frac{5}{8}$	5	8	17	$11\frac{1}{8}$
4	$8\frac{1}{8}$	14	$9\frac{7}{8}$	5	$0\frac{1}{8}$	15	$10\frac{3}{8}$	5	$4\frac{1}{8}$	16	11	5	$8\frac{1}{8}$	17	$11\frac{1}{2}$
4	$8\frac{1}{4}$	14	$10\frac{1}{4}$	5	$0\frac{1}{4}$	15	$10\frac{7}{8}$	5	$4\frac{1}{4}$	16	$11\frac{3}{8}$	5	$8\frac{1}{4}$	18	0
4	$8\frac{3}{8}$	14	$10\frac{5}{8}$	5	$0\frac{3}{8}$	15	$11\frac{1}{4}$	5	$4\frac{3}{8}$	16	$11\frac{3}{4}$	5	$8\frac{3}{8}$	18	$0\frac{3}{8}$
4	$8\frac{1}{2}$	14	11	5	$0\frac{1}{2}$	15	$11\frac{5}{8}$	5	$4\frac{1}{2}$	17	$0\frac{1}{8}$	5	$8\frac{1}{2}$	18	$0\frac{3}{4}$
4	$8\frac{5}{8}$	14	$11\frac{1}{2}$	5	$0\frac{5}{8}$	16	0	5	$4\frac{5}{8}$	17	$0\frac{5}{8}$	5	$8\frac{5}{8}$	18	$1\frac{1}{8}$
4	$8\frac{3}{4}$	14	$11\frac{7}{8}$	5	$0\frac{3}{4}$	16	$0\frac{3}{8}$	5	$4\frac{3}{4}$	17	1	5	$8\frac{3}{4}$	18	$1\frac{1}{2}$
4	$8\frac{7}{8}$	15	$0\frac{1}{4}$	5	$0\frac{7}{8}$	16	$0\frac{3}{4}$	5	$4\frac{7}{8}$	17	$1\frac{3}{8}$	5	$8\frac{7}{8}$	18	$1\frac{7}{8}$
4	9	15	$0\frac{5}{8}$	5	1	16	$1\frac{1}{8}$	5	5	17	$1\frac{3}{4}$	5	9	18	$2\frac{3}{8}$
4	$9\frac{1}{8}$	15	1	5	$1\frac{1}{8}$	16	$1\frac{5}{8}$	5	$5\frac{1}{8}$	17	$2\frac{1}{8}$	5	$9\frac{1}{8}$	18	$2\frac{3}{4}$
4	$9\frac{1}{4}$	15	$1\frac{3}{8}$	5	$1\frac{1}{4}$	16	2	5	$5\frac{1}{4}$	17	$2\frac{1}{2}$	5	$9\frac{1}{4}$	18	$3\frac{1}{8}$
4	$9\frac{3}{8}$	15	$1\frac{7}{8}$	5	$1\frac{3}{8}$	16	$2\frac{3}{8}$	5	$5\frac{3}{8}$	17	$2\frac{7}{8}$	5	$9\frac{3}{8}$	18	$3\frac{1}{2}$
4	$9\frac{1}{2}$	15	$2\frac{1}{4}$	5	$1\frac{1}{2}$	16	$2\frac{3}{4}$	5	$5\frac{1}{2}$	17	$3\frac{3}{8}$	5	$9\frac{1}{2}$	18	$3\frac{7}{8}$
4	$9\frac{5}{8}$	15	$2\frac{5}{8}$	5	$1\frac{5}{8}$	16	$3\frac{1}{8}$	5	$5\frac{5}{8}$	17	$3\frac{3}{4}$	5	$9\frac{5}{8}$	18	$4\frac{1}{4}$
4	$9\frac{3}{4}$	15	3	5	$1\frac{3}{4}$	16	$3\frac{1}{2}$	5	$5\frac{3}{4}$	17	$4\frac{1}{8}$	5	$9\frac{3}{4}$	18	$4\frac{5}{8}$
4	$9\frac{7}{8}$	15	$3\frac{3}{8}$	5	$1\frac{7}{8}$	16	$3\frac{7}{8}$	5	$5\frac{7}{8}$	17	$4\frac{1}{2}$	5	$9\frac{7}{8}$	18	5

For ANGLE IRON measuring $\frac{1}{4}$ of an Inch thick, diagonally across the root.

FLANGE OUTSIDE.

INSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.		INSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.		INSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.		INSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.	
FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.
5	10	18	$5\frac{1}{2}$	6	2	19	6	6	6	20	$6\frac{5}{8}$	6	10	21	$7\frac{1}{8}$
5	$10\frac{1}{8}$	18	$5\frac{7}{8}$	6	$2\frac{1}{8}$	19	$6\frac{3}{8}$	6	$6\frac{1}{8}$	20	7	6	$10\frac{1}{8}$	21	$7\frac{5}{8}$
5	$10\frac{1}{4}$	18	$6\frac{1}{4}$	6	$2\frac{1}{4}$	19	$6\frac{7}{8}$	6	$6\frac{1}{4}$	20	$7\frac{3}{8}$	6	$10\frac{1}{4}$	21	8
5	$10\frac{3}{8}$	18	$6\frac{5}{8}$	6	$2\frac{3}{8}$	19	$7\frac{1}{4}$	6	$6\frac{3}{8}$	20	$7\frac{3}{4}$	6	$10\frac{3}{8}$	21	$8\frac{3}{8}$
5	$10\frac{1}{2}$	18	7	6	$2\frac{1}{2}$	19	$7\frac{5}{8}$	6	$6\frac{1}{2}$	20	$8\frac{1}{8}$	6	$10\frac{1}{2}$	21	$8\frac{3}{4}$
5	$10\frac{5}{8}$	18	$7\frac{3}{8}$	6	$2\frac{5}{8}$	19	8	6	$6\frac{5}{8}$	20	$8\frac{1}{2}$	6	$10\frac{5}{8}$	21	$9\frac{1}{8}$
5	$10\frac{3}{4}$	18	$7\frac{7}{8}$	6	$2\frac{3}{4}$	19	$8\frac{3}{8}$	6	$6\frac{3}{4}$	20	9	6	$10\frac{3}{4}$	21	$9\frac{1}{2}$
5	$10\frac{7}{8}$	18	$8\frac{1}{4}$	6	$2\frac{7}{8}$	19	$8\frac{3}{4}$	6	$6\frac{7}{8}$	20	$9\frac{3}{8}$	6	$10\frac{7}{8}$	21	$9\frac{7}{8}$
5	11	18	$8\frac{5}{8}$	6	3	19	$9\frac{1}{8}$	6	7	20	$9\frac{3}{4}$	6	11	21	$10\frac{3}{8}$
5	$11\frac{1}{8}$	18	9	6	$3\frac{1}{8}$	19	$9\frac{5}{8}$	6	$7\frac{1}{8}$	20	$10\frac{1}{8}$	6	$11\frac{1}{8}$	21	$10\frac{3}{4}$
5	$11\frac{1}{4}$	18	$9\frac{3}{8}$	6	$3\frac{1}{4}$	19	10	6	$7\frac{1}{4}$	20	$10\frac{1}{2}$	6	$11\frac{1}{4}$	21	$11\frac{1}{8}$
5	$11\frac{3}{8}$	18	$9\frac{3}{4}$	6	$3\frac{3}{8}$	19	$10\frac{3}{8}$	6	$7\frac{3}{8}$	20	$10\frac{7}{8}$	6	$11\frac{3}{8}$	21	$11\frac{1}{2}$
5	$11\frac{1}{2}$	18	$10\frac{1}{8}$	6	$3\frac{1}{2}$	19	$10\frac{3}{4}$	6	$7\frac{1}{2}$	20	$11\frac{3}{8}$	6	$11\frac{1}{2}$	21	$11\frac{7}{8}$
5	$11\frac{5}{8}$	18	$10\frac{1}{2}$	6	$3\frac{5}{8}$	19	$11\frac{1}{8}$	6	$7\frac{5}{8}$	20	$11\frac{3}{4}$	6	$11\frac{5}{8}$	22	$0\frac{1}{4}$
5	$11\frac{3}{4}$	18	11	6	$3\frac{3}{4}$	19	$11\frac{1}{2}$	6	$7\frac{3}{4}$	21	$0\frac{1}{8}$	6	$11\frac{3}{4}$	22	$0\frac{5}{8}$
5	$11\frac{7}{8}$	18	$11\frac{3}{8}$	6	$3\frac{7}{8}$	19	$11\frac{7}{8}$	6	$7\frac{7}{8}$	21	$0\frac{1}{2}$	6	$11\frac{7}{8}$	22	1
6	0	18	$11\frac{3}{4}$	6	4	20	$0\frac{3}{8}$	6	8	21	$0\frac{7}{8}$	7	0	22	$1\frac{1}{2}$
6	$0\frac{1}{8}$	19	$0\frac{1}{8}$	6	$4\frac{1}{8}$	20	$0\frac{3}{4}$	6	$8\frac{1}{8}$	21	$1\frac{1}{4}$	7	$0\frac{1}{8}$	22	$1\frac{7}{8}$
6	$0\frac{1}{4}$	19	$0\frac{1}{2}$	6	$4\frac{1}{4}$	20	$1\frac{1}{8}$	6	$8\frac{1}{4}$	21	$1\frac{5}{8}$	7	$0\frac{1}{4}$	22	$2\frac{1}{4}$
6	$0\frac{3}{8}$	19	$0\frac{7}{8}$	6	$4\frac{3}{8}$	20	$1\frac{1}{2}$	6	$8\frac{3}{8}$	21	2	7	$0\frac{3}{8}$	22	$2\frac{5}{8}$
6	$0\frac{1}{2}$	19	$1\frac{3}{8}$	6	$4\frac{1}{2}$	20	$1\frac{7}{8}$	6	$8\frac{1}{2}$	21	$2\frac{1}{2}$	7	$0\frac{1}{2}$	22	3
6	$0\frac{5}{8}$	19	$1\frac{3}{4}$	6	$4\frac{5}{8}$	20	$2\frac{1}{4}$	6	$8\frac{5}{8}$	21	$2\frac{7}{8}$	7	$0\frac{5}{8}$	22	$3\frac{3}{8}$
6	$0\frac{3}{4}$	19	$2\frac{1}{8}$	6	$4\frac{3}{4}$	20	$2\frac{5}{8}$	6	$8\frac{3}{4}$	21	$3\frac{1}{4}$	7	$0\frac{3}{4}$	22	$3\frac{7}{8}$
6	$0\frac{7}{8}$	19	$2\frac{1}{2}$	6	$4\frac{7}{8}$	20	3	6	$8\frac{7}{8}$	21	$3\frac{5}{8}$	7	$0\frac{7}{8}$	22	$4\frac{1}{4}$
6	1	19	$2\frac{7}{8}$	6	5	20	$3\frac{1}{2}$	6	9	21	4	7	1	22	$4\frac{5}{8}$
6	$1\frac{1}{8}$	19	$3\frac{1}{4}$	6	$5\frac{1}{8}$	20	$3\frac{7}{8}$	6	$9\frac{1}{8}$	21	$4\frac{3}{8}$	7	$1\frac{1}{8}$	22	5
6	$1\frac{1}{4}$	19	$3\frac{5}{8}$	6	$5\frac{1}{4}$	20	$4\frac{1}{4}$	6	$9\frac{1}{4}$	21	$4\frac{3}{4}$	7	$1\frac{1}{4}$	22	$5\frac{3}{8}$
6	$1\frac{3}{8}$	19	4	6	$5\frac{3}{8}$	20	$4\frac{5}{8}$	6	$9\frac{3}{8}$	21	$5\frac{1}{8}$	7	$1\frac{3}{8}$	22	$5\frac{3}{4}$
6	$1\frac{1}{2}$	19	$4\frac{1}{2}$	6	$5\frac{1}{2}$	20	5	6	$9\frac{1}{2}$	21	$5\frac{1}{2}$	7	$1\frac{1}{2}$	22	$6\frac{1}{8}$
6	$1\frac{5}{8}$	19	$4\frac{7}{8}$	6	$5\frac{5}{8}$	20	$5\frac{3}{8}$	6	$9\frac{5}{8}$	21	6	7	$1\frac{5}{8}$	22	$6\frac{1}{2}$
6	$1\frac{3}{4}$	19	$5\frac{1}{4}$	6	$5\frac{3}{4}$	20	$5\frac{7}{8}$	6	$9\frac{3}{4}$	21	$6\frac{3}{8}$	7	$1\frac{3}{4}$	22	7
6	$1\frac{7}{8}$	19	$5\frac{5}{8}$	6	$5\frac{7}{8}$	20	$6\frac{1}{4}$	6	$9\frac{7}{8}$	21	$6\frac{3}{4}$	7	$1\frac{7}{8}$	22	$7\frac{3}{8}$

For Angle Iron measuring $\frac{1}{4}$ of an Inch thick, diagonally across the root.

FLANGE OUTSIDE.

INSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.		INSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.		INSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.		INSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.	
FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.
7	2	22	7¾	7	6	23	8¼	7	10	24	8⅞	8	2	25	9½
7	2⅛	22	8⅛	7	6⅛	23	8¾	7	10⅛	24	9¼	8	2⅛	25	9⅞
7	2¼	22	8½	7	6¼	23	9⅛	7	10¼	24	9⅝	8	2¼	25	10¼
7	2⅜	22	8⅞	7	6⅜	23	9½	7	10⅜	24	10	8	2⅜	25	10⅝
7	2½	22	9¼	7	6½	23	9⅞	7	10½	24	10½	8	2½	25	11
7	2⅝	22	9¾	7	6⅝	23	10¼	7	10⅝	24	10⅞	8	2⅝	25	11⅜
7	2¾	22	10⅛	7	6¾	23	10⅝	7	10¾	24	11¼	8	2¾	25	11¾
7	2⅞	22	10½	7	6⅞	23	11	7	10⅞	24	11⅝	8	2⅞	26	0⅛
7	3	22	10⅞	7	7	23	11½	7	11	25	0	8	3	26	0⅝
7	3⅛	22	11¼	7	7⅛	23	11⅞	7	11⅛	25	0⅜	8	3⅛	26	1
7	3¼	22	11⅝	7	7¼	24	0¼	7	11¼	25	0¾	8	3¼	26	1⅜
7	3⅜	23	0	7	7⅜	24	0⅝	7	11⅜	25	1¼	8	3⅜	26	1¾
7	3½	23	0½	7	7½	24	1	7	11½	25	1⅝	8	3½	26	2⅛
7	3⅝	23	0⅞	7	7⅝	24	1⅜	7	11⅝	25	2	8	3⅝	26	2½
7	3¾	23	1¼	7	7¾	24	1¾	7	11¾	25	2⅜	8	3¾	26	2⅞
7	3⅞	23	1⅝	7	7⅞	24	2¼	7	11⅞	25	2¾	8	3⅞	26	3⅜
7	4	23	2	7	8	24	2⅝	8	0	25	3⅛	8	4	26	3¾
7	4⅛	23	2⅜	7	8⅛	24	3	8	0⅛	25	3½	8	4⅛	26	4⅛
7	4¼	23	2¾	7	8¼	24	3⅜	8	0¼	25	3⅞	8	4¼	26	4½
7	4⅜	23	3¼	7	8⅜	24	3¾	8	0⅜	25	4⅜	8	4⅜	26	4⅞
7	4½	23	3⅝	7	8½	24	4⅛	8	0½	25	4¾	8	4½	26	5¼
7	4⅝	23	4	7	8⅝	24	4½	8	0⅝	25	5⅛	8	4⅝	26	5⅝
7	4¾	23	4⅜	7	8¾	24	4⅞	8	0¾	25	5½	8	4¾	26	6
7	4⅞	23	4¾	7	8⅞	24	5⅜	8	0⅞	25	5⅞	8	4⅞	26	6½
7	5	23	5⅛	7	9	24	5¾	8	1	25	6¼	8	5	26	6⅞
7	5⅛	23	5½	7	9⅛	24	6⅛	8	1⅛	25	6⅝	8	5⅛	26	7¼
7	5¼	23	6	7	9¼	24	6½	8	1¼	25	7	8	5¼	26	7⅝
7	5⅜	23	6⅜	7	9⅜	24	6⅞	8	1⅜	25	7½	8	5⅜	26	8
7	5½	23	6¾	7	9½	24	7¼	8	1½	25	7⅞	8	5½	26	8⅜
7	5⅝	23	7⅛	7	9⅝	24	7⅝	8	1⅝	25	8¼	8	5⅝	26	8⅞
7	5¾	23	7½	7	9¾	24	8	8	1¾	25	8⅝	8	5¾	26	9¼
7	5⅞	23	7⅞	7	9⅞	24	8½	8	1⅞	25	9	8	5⅞	26	9⅝

TABLE II.,

For Angle Iron measuring $\frac{3}{8}$ of an Inch thick, diagonally across the root.

FLANGE OUTSIDE.

Inside Diameter of Ring.	Length Required for Ring.		Inside Diameter of Ring.		Length Required for Ring.		Inside Diameter of Ring.		Length Required for Ring.		Inside Diameter of Ring.		Length Required for Ring.	
IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.
6	1	$9\frac{1}{8}$	0	10	2	$9\frac{3}{4}$	1	2	3	$10\frac{3}{8}$	1	6	4	$10\frac{7}{8}$
$6\frac{1}{8}$	1	$9\frac{1}{2}$	0	$10\frac{1}{8}$	2	$10\frac{1}{8}$	1	$2\frac{1}{8}$	3	$10\frac{3}{4}$	1	$6\frac{1}{8}$	4	$11\frac{1}{4}$
$6\frac{1}{4}$	1	$9\frac{7}{8}$	0	$10\frac{1}{4}$	2	$10\frac{1}{2}$	1	$2\frac{1}{4}$	3	$11\frac{1}{8}$	1	$6\frac{1}{4}$	4	$11\frac{5}{8}$
$6\frac{3}{8}$	1	$10\frac{3}{8}$	0	$10\frac{3}{8}$	2	$10\frac{7}{8}$	1	$2\frac{3}{8}$	3	$11\frac{1}{2}$	1	$6\frac{3}{8}$	5	0
$6\frac{1}{2}$	1	$10\frac{3}{4}$	0	$10\frac{1}{2}$	2	$11\frac{3}{8}$	1	$2\frac{1}{2}$	3	$11\frac{7}{8}$	1	$6\frac{1}{2}$	5	$0\frac{3}{8}$
$6\frac{5}{8}$	1	$11\frac{1}{8}$	0	$10\frac{5}{8}$	2	$11\frac{3}{4}$	1	$2\frac{5}{8}$	4	$0\frac{1}{4}$	1	$6\frac{5}{8}$	5	$0\frac{3}{4}$
$6\frac{3}{4}$	1	$11\frac{1}{2}$	0	$10\frac{3}{4}$	3	$0\frac{1}{8}$	1	$2\frac{3}{4}$	4	$0\frac{5}{8}$	1	$6\frac{3}{4}$	5	$1\frac{1}{4}$
$6\frac{7}{8}$	1	$11\frac{7}{8}$	0	$10\frac{7}{8}$	3	$0\frac{1}{2}$	1	$2\frac{7}{8}$	4	1	1	$6\frac{7}{8}$	5	$1\frac{5}{8}$
7	2	$0\frac{3}{8}$	0	11	3	$0\frac{7}{8}$	1	3	4	$1\frac{3}{8}$	1	7	5	2
$7\frac{1}{8}$	2	$0\frac{3}{4}$	0	$11\frac{1}{8}$	3	$1\frac{1}{4}$	1	$3\frac{1}{8}$	4	$1\frac{7}{8}$	1	$7\frac{1}{8}$	5	$2\frac{3}{8}$
$7\frac{1}{4}$	2	$1\frac{1}{8}$	0	$11\frac{1}{4}$	3	$1\frac{5}{8}$	1	$3\frac{1}{4}$	4	$2\frac{1}{4}$	1	$7\frac{1}{4}$	5	$2\frac{3}{4}$
$7\frac{3}{8}$	2	$1\frac{1}{2}$	0	$11\frac{3}{8}$	3	2	1	$3\frac{3}{8}$	4	$2\frac{5}{8}$	1	$7\frac{3}{8}$	5	$3\frac{1}{8}$
$7\frac{1}{2}$	2	$1\frac{7}{8}$	0	$11\frac{1}{2}$	3	$2\frac{1}{2}$	1	$3\frac{1}{2}$	4	3	1	$7\frac{1}{2}$	5	$3\frac{5}{8}$
$7\frac{5}{8}$	2	$2\frac{3}{8}$	0	$11\frac{5}{8}$	3	$2\frac{7}{8}$	1	$3\frac{5}{8}$	4	$3\frac{3}{8}$	1	$7\frac{5}{8}$	5	4
$7\frac{3}{4}$	2	$2\frac{3}{4}$	0	$11\frac{3}{4}$	3	$3\frac{1}{4}$	1	$3\frac{3}{4}$	4	$3\frac{3}{4}$	1	$7\frac{3}{4}$	5	$4\frac{3}{8}$
$7\frac{7}{8}$	2	$3\frac{1}{8}$	0	$11\frac{7}{8}$	3	$3\frac{5}{8}$	1	$3\frac{7}{8}$	4	$4\frac{1}{8}$	1	$7\frac{7}{8}$	5	$4\frac{3}{4}$
8	2	$3\frac{1}{2}$	1	0	3	4	1	4	4	$4\frac{1}{2}$	1	8	5	$5\frac{1}{8}$
$8\frac{1}{8}$	2	$3\frac{7}{8}$	1	$0\frac{1}{8}$	3	$4\frac{3}{8}$	1	$4\frac{1}{8}$	4	5	1	$8\frac{1}{8}$	5	$5\frac{1}{2}$
$8\frac{1}{4}$	2	$4\frac{1}{4}$	1	$0\frac{1}{4}$	3	$4\frac{7}{8}$	1	$4\frac{1}{4}$	4	$5\frac{3}{8}$	1	$8\frac{1}{4}$	5	$5\frac{7}{8}$
$8\frac{3}{8}$	2	$4\frac{5}{8}$	1	$0\frac{3}{8}$	3	$5\frac{1}{4}$	1	$4\frac{3}{8}$	4	$5\frac{3}{4}$	1	$8\frac{3}{8}$	5	$6\frac{3}{8}$
$8\frac{1}{2}$	2	5	1	$0\frac{1}{2}$	3	$5\frac{5}{8}$	1	$4\frac{1}{2}$	4	$6\frac{1}{8}$	1	$8\frac{1}{2}$	5	$6\frac{3}{4}$
$8\frac{5}{8}$	2	$5\frac{1}{2}$	1	$0\frac{5}{8}$	3	6	1	$4\frac{5}{8}$	4	$6\frac{1}{2}$	1	$8\frac{5}{8}$	5	$7\frac{1}{8}$
$8\frac{3}{4}$	2	$5\frac{7}{8}$	1	$0\frac{3}{4}$	3	$6\frac{3}{8}$	1	$4\frac{3}{4}$	4	7	1	$8\frac{3}{4}$	5	$7\frac{1}{2}$
$8\frac{7}{8}$	2	$6\frac{1}{4}$	1	$0\frac{7}{8}$	3	$6\frac{3}{4}$	1	$4\frac{7}{8}$	4	$7\frac{3}{8}$	1	$8\frac{7}{8}$	5	8
9	2	$6\frac{5}{8}$	1	1	3	$7\frac{1}{8}$	1	5	4	$7\frac{3}{4}$	1	9	5	$8\frac{3}{8}$
$9\frac{1}{8}$	2	7	1	$1\frac{1}{8}$	3	$7\frac{5}{8}$	1	$5\frac{1}{8}$	4	$8\frac{1}{8}$	1	$9\frac{1}{8}$	5	$8\frac{3}{4}$
$9\frac{1}{4}$	2	$7\frac{3}{8}$	1	$1\frac{1}{4}$	3	8	1	$5\frac{1}{4}$	4	$8\frac{1}{2}$	1	$9\frac{1}{4}$	5	$9\frac{1}{8}$
$9\frac{3}{8}$	2	$7\frac{3}{4}$	1	$1\frac{3}{8}$	3	$8\frac{3}{8}$	1	$5\frac{3}{8}$	4	$8\frac{7}{8}$	1	$9\frac{3}{8}$	5	$9\frac{1}{2}$
$9\frac{1}{2}$	2	$8\frac{1}{4}$	1	$1\frac{1}{2}$	3	$8\frac{3}{4}$	1	$5\frac{1}{2}$	4	$9\frac{1}{4}$	1	$9\frac{1}{2}$	5	$9\frac{7}{8}$
$9\frac{5}{8}$	2	$8\frac{5}{8}$	1	$1\frac{5}{8}$	3	$9\frac{1}{8}$	1	$5\frac{5}{8}$	4	$9\frac{5}{8}$	1	$9\frac{5}{8}$	5	$10\frac{1}{4}$
$9\frac{3}{4}$	2	9	1	$1\frac{3}{4}$	3	$9\frac{1}{2}$	1	$5\frac{3}{4}$	4	$10\frac{1}{8}$	1	$9\frac{3}{4}$	5	$10\frac{5}{8}$
$9\frac{7}{8}$	2	$9\frac{3}{8}$	1	$1\frac{7}{8}$	3	$9\frac{7}{8}$	1	$5\frac{7}{8}$	4	$10\frac{1}{2}$	1	$9\frac{7}{8}$	5	11

For Angle Iron measuring $\frac{3}{8}$ of an Inch thick, diagonally across the root.

FLANGE OUTSIDE.

INSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.		INSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.		INSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.		INSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.	
FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.
1	10	5	11½	2	2	7	0	2	6	8	0½	2	10	9	1⅛
1	10⅛	5	11⅞	2	2⅛	7	0⅜	2	6⅛	8	1	2	10⅛	9	1½
1	10¼	6	0¼	2	2¼	7	0¾	2	6¼	8	1⅜	2	10¼	9	1⅞
1	10⅜	6	0⅜	2	2⅜	7	1⅛	2	6⅜	8	1¾	2	10⅜	9	2⅜
1	10½	6	1	2	2½	7	1½	2	6½	8	2⅛	2	10½	9	2¾
1	10⅝	6	1⅜	2	2⅝	7	2	2	6⅝	8	2½	2	10⅝	9	3⅛
1	10¾	6	1¾	2	2¾	7	2⅜	2	6¾	8	2⅞	2	10¾	9	3½
1	10⅞	6	2¼	2	2⅞	7	2¾	2	6⅞	8	3⅜	2	10⅞	9	3⅞
1	11	6	2⅝	2	3	7	3⅛	2	7	8	3¾	2	11	9	4¼
1	11⅛	6	3	2	3⅛	7	3½	2	7⅛	8	4⅛	2	11⅛	9	4⅝
1	11¼	6	3⅜	2	3¼	7	3⅞	2	7¼	8	4½	2	11¼	9	5
1	11⅜	6	3¾	2	3⅜	7	4⅜	2	7⅜	8	4⅞	2	11⅜	9	5½
1	11½	6	4⅛	2	3½	7	4¾	2	7½	8	5¼	2	11½	9	5⅞
1	11⅝	6	4½	2	3⅝	7	5⅛	2	7⅝	8	5⅝	2	11⅝	9	6¼
1	11¾	6	4⅞	2	3¾	7	5½	2	7¾	8	6	2	11¾	9	6⅝
1	11⅞	6	5⅜	2	3⅞	7	5⅞	2	7⅞	8	6½	2	11⅞	9	7
2	0	6	5¾	2	4	7	6¼	2	8	8	6⅞	3	0	9	7⅜
2	0⅛	6	6⅛	2	4⅛	7	6⅝	2	8⅛	8	7¼	3	0⅛	9	7⅞
2	0¼	6	6½	2	4¼	7	7	2	8¼	8	7⅝	3	0¼	9	8¼
2	0⅜	6	6⅞	2	4⅜	7	7½	2	8⅜	8	8	3	0⅜	9	8⅝
2	0½	6	7¼	2	4½	7	7⅞	2	8½	8	8⅜	3	0½	9	9
2	0⅝	6	7⅝	2	4⅝	7	8¼	2	8⅝	8	8⅞	3	0⅝	9	9⅜
2	0¾	6	8⅛	2	4¾	7	8⅝	2	8¾	8	9¼	3	0¾	9	9¾
2	0⅞	6	8½	2	4⅞	7	9	2	8⅞	8	9⅝	3	0⅞	9	10⅛
2	1	6	8⅞	2	5	7	9⅜	2	9	8	10	3	1	9	10½
2	1⅛	6	9¼	2	5⅛	7	9¾	2	9⅛	8	10⅜	3	1⅛	9	10⅞
2	1¼	6	9⅝	2	5¼	7	10¼	2	9¼	8	10¾	3	1¼	9	11⅜
2	1⅜	6	10	2	5⅜	7	10⅝	2	9⅜	8	11⅛	3	1⅜	9	11¾
2	1½	6	10½	2	5½	7	11	2	9½	8	11½	3	1½	10	0⅛
2	1⅝	6	10⅞	2	5⅝	7	11⅜	2	9⅝	9	0	3	1⅝	10	0½
2	1¾	6	11¼	2	5¾	7	11¾	2	9¾	9	0⅜	3	1¾	10	0⅞
2	1⅞	6	11⅝	2	5⅞	8	0⅛	2	9⅞	9	0¾	3	1⅞	10	1⅜

For Angle Iron measuring $\frac{3}{8}$ of an Inch thick, diagonally across the root.

FLANGE OUTSIDE.

INSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.		INSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.		INSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.		INSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.	
FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.
3	2	10	$1\frac{3}{4}$	3	6	11	$2\frac{1}{4}$	3	10	12	$2\frac{7}{8}$	4	2	13	$3\frac{3}{8}$
3	$2\frac{1}{8}$	10	$2\frac{1}{8}$	3	$6\frac{1}{8}$	11	$2\frac{5}{8}$	3	$10\frac{1}{8}$	12	$3\frac{1}{4}$	4	$2\frac{1}{8}$	13	$3\frac{3}{4}$
3	$2\frac{1}{4}$	10	$2\frac{1}{2}$	3	$6\frac{1}{4}$	11	3	3	$10\frac{1}{4}$	12	$3\frac{5}{8}$	4	$2\frac{1}{4}$	13	$4\frac{1}{4}$
3	$2\frac{3}{8}$	10	$2\frac{7}{8}$	3	$6\frac{3}{8}$	11	$3\frac{1}{2}$	3	$10\frac{3}{8}$	12	4	4	$2\frac{3}{8}$	13	$4\frac{5}{8}$
3	$2\frac{1}{2}$	10	$3\frac{1}{4}$	3	$6\frac{1}{2}$	11	$3\frac{7}{8}$	3	$10\frac{1}{2}$	12	$4\frac{3}{8}$	4	$2\frac{1}{2}$	13	5
3	$2\frac{5}{8}$	10	$3\frac{5}{8}$	3	$6\frac{5}{8}$	11	$4\frac{1}{4}$	3	$10\frac{5}{8}$	12	$4\frac{3}{4}$	4	$2\frac{5}{8}$	13	$5\frac{3}{8}$
3	$2\frac{3}{4}$	10	4	3	$6\frac{3}{4}$	11	$4\frac{5}{8}$	3	$10\frac{3}{4}$	12	$5\frac{1}{4}$	4	$2\frac{3}{4}$	13	$5\frac{3}{4}$
3	$2\frac{7}{8}$	10	$4\frac{1}{2}$	3	$6\frac{7}{8}$	11	5	3	$10\frac{7}{8}$	12	$5\frac{5}{8}$	4	$2\frac{7}{8}$	13	$6\frac{1}{8}$
3	3	10	$4\frac{7}{8}$	3	7	11	$5\frac{3}{8}$	3	11	12	6	4	3	13	$6\frac{1}{2}$
3	$3\frac{1}{8}$	10	$5\frac{1}{4}$	3	$7\frac{1}{8}$	11	$5\frac{3}{4}$	3	$11\frac{1}{8}$	12	$6\frac{3}{8}$	4	$3\frac{1}{8}$	13	7
3	$3\frac{1}{4}$	10	$5\frac{5}{8}$	3	$7\frac{1}{4}$	11	$6\frac{1}{4}$	3	$11\frac{1}{4}$	12	$6\frac{3}{4}$	4	$3\frac{1}{4}$	13	$7\frac{3}{8}$
3	$3\frac{3}{8}$	10	6	3	$7\frac{3}{8}$	11	$6\frac{5}{8}$	3	$11\frac{3}{8}$	12	$7\frac{1}{8}$	4	$3\frac{3}{8}$	13	$7\frac{3}{4}$
3	$3\frac{1}{2}$	10	$6\frac{3}{8}$	3	$7\frac{1}{2}$	11	7	3	$11\frac{1}{2}$	12	$7\frac{1}{2}$	4	$3\frac{1}{2}$	13	$8\frac{1}{8}$
3	$3\frac{5}{8}$	10	$6\frac{7}{8}$	3	$7\frac{5}{8}$	11	$7\frac{3}{8}$	3	$11\frac{5}{8}$	12	$7\frac{7}{8}$	4	$3\frac{5}{8}$	13	$8\frac{1}{2}$
3	$3\frac{3}{4}$	10	$7\frac{1}{4}$	3	$7\frac{3}{4}$	11	$7\frac{3}{4}$	3	$11\frac{3}{4}$	12	$8\frac{3}{8}$	4	$3\frac{3}{4}$	13	$8\frac{7}{8}$
3	$3\frac{7}{8}$	10	$7\frac{5}{8}$	3	$7\frac{7}{8}$	11	$8\frac{1}{8}$	3	$11\frac{7}{8}$	12	$8\frac{3}{4}$	4	$3\frac{7}{8}$	13	$9\frac{1}{4}$
3	4	10	8	3	8	11	$8\frac{1}{2}$	4	0	12	$9\frac{1}{8}$	4	4	13	$9\frac{5}{8}$
3	$4\frac{1}{8}$	10	$8\frac{3}{8}$	3	$8\frac{1}{8}$	11	$8\frac{7}{8}$	4	$0\frac{1}{8}$	12	$9\frac{1}{2}$	4	$4\frac{1}{8}$	13	$10\frac{1}{8}$
3	$4\frac{1}{4}$	10	$8\frac{3}{4}$	3	$8\frac{1}{4}$	11	$9\frac{3}{8}$	4	$0\frac{1}{4}$	12	$9\frac{7}{8}$	4	$4\frac{1}{4}$	13	$10\frac{1}{2}$
3	$4\frac{3}{8}$	10	$9\frac{1}{8}$	3	$8\frac{3}{8}$	11	$9\frac{3}{4}$	4	$0\frac{3}{8}$	12	$10\frac{3}{8}$	4	$4\frac{3}{8}$	13	$10\frac{7}{8}$
3	$4\frac{1}{2}$	10	$9\frac{1}{2}$	3	$8\frac{1}{2}$	11	$10\frac{1}{8}$	4	$0\frac{1}{2}$	12	$10\frac{3}{4}$	4	$4\frac{1}{2}$	13	$11\frac{1}{4}$
3	$4\frac{5}{8}$	10	$9\frac{7}{8}$	3	$8\frac{5}{8}$	11	$10\frac{1}{2}$	4	$0\frac{5}{8}$	12	$11\frac{1}{8}$	4	$4\frac{5}{8}$	13	$11\frac{5}{8}$
3	$4\frac{3}{4}$	10	$10\frac{3}{8}$	3	$8\frac{3}{4}$	11	$10\frac{7}{8}$	4	$0\frac{3}{4}$	12	$11\frac{1}{2}$	4	$4\frac{3}{4}$	14	0
3	$4\frac{7}{8}$	10	$10\frac{3}{4}$	3	$8\frac{7}{8}$	11	$11\frac{1}{4}$	4	$0\frac{7}{8}$	12	$11\frac{7}{8}$	4	$4\frac{7}{8}$	14	$0\frac{3}{8}$
3	5	10	$11\frac{1}{8}$	3	9	11	$11\frac{5}{8}$	4	1	13	$0\frac{1}{4}$	4	5	14	$0\frac{7}{8}$
3	$5\frac{1}{8}$	10	$11\frac{1}{2}$	3	$9\frac{1}{8}$	12	$0\frac{1}{8}$	4	$1\frac{1}{8}$	13	$0\frac{5}{8}$	4	$5\frac{1}{8}$	14	$1\frac{1}{4}$
3	$5\frac{1}{4}$	10	$11\frac{7}{8}$	3	$9\frac{1}{4}$	12	$0\frac{1}{2}$	4	$1\frac{1}{4}$	13	1	4	$5\frac{1}{4}$	14	$1\frac{5}{8}$
3	$5\frac{3}{8}$	11	$0\frac{3}{8}$	3	$9\frac{3}{8}$	12	$0\frac{7}{8}$	4	$1\frac{3}{8}$	13	$1\frac{1}{2}$	4	$5\frac{3}{8}$	14	2
3	$5\frac{1}{2}$	11	$0\frac{3}{4}$	3	$9\frac{1}{2}$	12	$1\frac{1}{4}$	4	$1\frac{1}{2}$	13	$1\frac{7}{8}$	4	$5\frac{1}{2}$	14	$2\frac{3}{8}$
3	$5\frac{5}{8}$	11	$1\frac{1}{8}$	3	$9\frac{5}{8}$	12	$1\frac{5}{8}$	4	$1\frac{5}{8}$	13	$2\frac{1}{4}$	4	$5\frac{5}{8}$	14	$2\frac{3}{4}$
3	$5\frac{3}{4}$	11	$1\frac{1}{2}$	3	$9\frac{3}{4}$	12	2	4	$1\frac{3}{4}$	13	$2\frac{5}{8}$	4	$5\frac{3}{4}$	14	$3\frac{1}{8}$
3	$5\frac{7}{8}$	11	$1\frac{7}{8}$	3	$9\frac{7}{8}$	12	$2\frac{3}{8}$	4	$1\frac{7}{8}$	13	3	4	$5\frac{7}{8}$	14	$3\frac{1}{2}$

For Angle Iron measuring $\frac{3}{8}$ of an Inch thick, diagonally across the root.

FLANGE OUTSIDE.

INSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.		INSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.		INSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.		INSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.	
FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.
4	6	14	4	4	10	15	$4\frac{1}{2}$	5	2	16	$5\frac{1}{8}$	5	6	17	$5\frac{5}{8}$
4	$6\frac{1}{8}$	14	$4\frac{3}{8}$	4	$10\frac{1}{8}$	15	$4\frac{7}{8}$	5	$2\frac{1}{8}$	16	$5\frac{1}{2}$	5	$6\frac{1}{8}$	17	6
4	$6\frac{1}{4}$	14	$4\frac{3}{4}$	4	$10\frac{1}{4}$	15	$5\frac{3}{8}$	5	$2\frac{1}{4}$	16	$5\frac{7}{8}$	5	$6\frac{1}{4}$	17	$6\frac{1}{2}$
4	$6\frac{3}{8}$	14	$5\frac{1}{8}$	4	$10\frac{3}{8}$	15	$5\frac{3}{4}$	5	$2\frac{3}{8}$	16	$6\frac{1}{4}$	5	$6\frac{3}{8}$	17	$6\frac{7}{8}$
4	$6\frac{1}{2}$	14	$5\frac{1}{2}$	4	$10\frac{1}{2}$	15	$6\frac{1}{8}$	5	$2\frac{1}{2}$	16	$6\frac{5}{8}$	5	$6\frac{1}{2}$	17	$7\frac{1}{4}$
4	$6\frac{5}{8}$	14	$5\frac{7}{8}$	4	$10\frac{5}{8}$	15	$6\frac{1}{2}$	5	$2\frac{5}{8}$	16	7	5	$6\frac{5}{8}$	17	$7\frac{5}{8}$
4	$6\frac{3}{4}$	14	$6\frac{3}{8}$	4	$10\frac{3}{4}$	15	$6\frac{7}{8}$	5	$2\frac{3}{4}$	16	$7\frac{1}{2}$	5	$6\frac{3}{4}$	17	8
4	$6\frac{7}{8}$	14	$6\frac{3}{4}$	4	$10\frac{7}{8}$	15	$7\frac{1}{4}$	5	$2\frac{7}{8}$	16	$7\frac{7}{8}$	5	$6\frac{7}{8}$	17	$8\frac{3}{8}$
4	7	14	$7\frac{1}{8}$	4	11	15	$7\frac{3}{4}$	5	3	16	$8\frac{1}{4}$	5	7	17	$8\frac{7}{8}$
4	$7\frac{1}{8}$	14	$7\frac{1}{2}$	4	$11\frac{1}{8}$	15	$8\frac{1}{8}$	5	$3\frac{1}{8}$	16	$8\frac{5}{8}$	5	$7\frac{1}{8}$	17	$9\frac{1}{4}$
4	$7\frac{1}{4}$	14	$7\frac{7}{8}$	4	$11\frac{1}{4}$	15	$8\frac{1}{2}$	5	$3\frac{1}{4}$	16	9	5	$7\frac{1}{4}$	17	$9\frac{3}{8}$
4	$7\frac{3}{8}$	14	$8\frac{1}{4}$	4	$11\frac{3}{8}$	15	$8\frac{7}{8}$	5	$3\frac{3}{8}$	16	$9\frac{3}{8}$	5	$7\frac{3}{8}$	17	10
4	$7\frac{1}{2}$	14	$8\frac{3}{4}$	4	$11\frac{1}{2}$	15	$9\frac{1}{4}$	5	$3\frac{1}{2}$	16	$9\frac{7}{8}$	5	$7\frac{1}{2}$	17	$10\frac{3}{8}$
4	$7\frac{5}{8}$	14	$9\frac{1}{8}$	4	$11\frac{5}{8}$	15	$9\frac{5}{8}$	5	$3\frac{5}{8}$	16	$10\frac{1}{4}$	5	$7\frac{5}{8}$	17	$10\frac{3}{4}$
4	$7\frac{3}{4}$	14	$9\frac{1}{2}$	4	$11\frac{3}{4}$	15	10	5	$3\frac{3}{4}$	16	$10\frac{5}{8}$	5	$7\frac{3}{4}$	17	$11\frac{1}{8}$
4	$7\frac{7}{8}$	14	$9\frac{7}{8}$	4	$11\frac{7}{8}$	15	$10\frac{3}{8}$	5	$3\frac{7}{8}$	16	11	5	$7\frac{7}{8}$	17	$11\frac{1}{2}$
4	8	14	$10\frac{1}{4}$	5	0	15	$10\frac{7}{8}$	5	4	16	$11\frac{3}{8}$	5	8	18	0
4	$8\frac{1}{8}$	14	$10\frac{5}{8}$	5	$0\frac{1}{8}$	15	$11\frac{1}{4}$	5	$4\frac{1}{8}$	16	$11\frac{3}{4}$	5	$8\frac{1}{8}$	18	$0\frac{3}{8}$
4	$8\frac{1}{4}$	14	11	5	$0\frac{1}{4}$	15	$11\frac{5}{8}$	5	$4\frac{1}{4}$	17	$0\frac{1}{8}$	5	$8\frac{1}{4}$	18	$0\frac{3}{4}$
4	$8\frac{3}{8}$	14	$11\frac{1}{2}$	5	$0\frac{3}{8}$	16	0	5	$4\frac{3}{8}$	17	$0\frac{5}{8}$	5	$8\frac{3}{8}$	18	$1\frac{1}{8}$
4	$8\frac{1}{2}$	14	$11\frac{7}{8}$	5	$0\frac{1}{2}$	16	$0\frac{3}{8}$	5	$4\frac{1}{2}$	17	1	5	$8\frac{1}{2}$	18	$1\frac{1}{2}$
4	$8\frac{5}{8}$	15	$0\frac{1}{4}$	5	$0\frac{5}{8}$	16	$0\frac{3}{4}$	5	$4\frac{5}{8}$	17	$1\frac{3}{8}$	5	$8\frac{5}{8}$	18	$1\frac{7}{8}$
4	$8\frac{3}{4}$	15	$0\frac{5}{8}$	5	$0\frac{3}{4}$	16	$1\frac{1}{8}$	5	$4\frac{3}{4}$	17	$1\frac{3}{4}$	5	$8\frac{3}{4}$	18	$2\frac{3}{8}$
4	$8\frac{7}{8}$	15	1	5	$0\frac{7}{8}$	16	$1\frac{5}{8}$	5	$4\frac{7}{8}$	17	$2\frac{1}{8}$	5	$8\frac{7}{8}$	18	$2\frac{3}{4}$
4	9	15	$1\frac{3}{8}$	5	1	16	2	5	5	17	$2\frac{1}{2}$	5	9	18	$3\frac{1}{8}$
4	$9\frac{1}{8}$	15	$1\frac{7}{8}$	5	$1\frac{1}{8}$	16	$2\frac{3}{8}$	5	$5\frac{1}{8}$	17	$2\frac{7}{8}$	5	$9\frac{1}{8}$	18	$3\frac{1}{2}$
4	$9\frac{1}{4}$	15	$2\frac{1}{4}$	5	$1\frac{1}{4}$	16	$2\frac{3}{4}$	5	$5\frac{1}{4}$	17	$3\frac{3}{8}$	5	$9\frac{1}{4}$	18	$3\frac{7}{8}$
4	$9\frac{3}{8}$	15	$2\frac{5}{8}$	5	$1\frac{3}{8}$	16	$3\frac{1}{8}$	5	$5\frac{3}{8}$	17	$3\frac{3}{4}$	5	$9\frac{3}{8}$	18	$4\frac{1}{4}$
4	$9\frac{1}{2}$	15	3	5	$1\frac{1}{2}$	16	$3\frac{1}{2}$	5	$5\frac{1}{2}$	17	$4\frac{1}{8}$	5	$9\frac{1}{9}$	18	$4\frac{5}{8}$
4	$9\frac{5}{8}$	15	$3\frac{3}{8}$	5	$1\frac{5}{8}$	16	$3\frac{7}{8}$	5	$5\frac{5}{8}$	17	$4\frac{1}{2}$	5	$9\frac{5}{8}$	18	5
4	$9\frac{3}{4}$	15	$3\frac{3}{4}$	5	$1\frac{3}{4}$	16	$4\frac{3}{8}$	5	$5\frac{3}{4}$	17	$4\frac{7}{8}$	5	$9\frac{3}{4}$	18	$5\frac{1}{2}$
4	$9\frac{7}{8}$	15	$4\frac{1}{8}$	5	$1\frac{7}{8}$	16	$4\frac{3}{4}$	5	$5\frac{7}{8}$	17	$5\frac{1}{4}$	5	$9\frac{7}{8}$	18	$5\frac{7}{8}$

For Angle Iron measuring $\frac{3}{8}$ of an Inch thick, diagonally across the root.

FLANGE OUTSIDE.

Inside Diameter of Ring.		Length required for Ring.		Inside Diameter of Ring.		Length required for Ring.		Inside Diameter of Ring.		Length required for Ring.		Inside Diameter of Ring.		Length required for Ring.	
Ft.	In.	Ft.	In.	Ft.	In.	Ft.	In.	Ft.	In.	Ft.	In.	Ft.	In.	Ft.	In.
5	10	18	6¼	6	2	19	6⅞	6	6	20	7⅜	6	10	21	8
5	10⅛	18	6⅝	6	2⅛	19	7¼	6	6⅛	20	7¾	6	10⅛	21	8⅜
5	10¼	18	7	6	2¼	19	7⅝	6	6¼	20	8⅛	6	10¼	21	8¾
5	10⅜	18	7⅜	6	2⅜	19	8	6	6⅜	20	8½	6	10⅜	21	9⅛
5	10½	18	7⅞	6	2½	19	8⅜	6	6½	20	9	6	10½	21	9½
5	10⅝	18	8¼	6	2⅝	19	8¾	6	6⅝	20	9⅜	6	10⅝	21	9⅞
5	10¾	18	8⅝	6	2¾	19	9⅛	6	6¾	20	9¾	6	10¾	21	10⅜
5	10⅞	18	9	6	2⅞	19	9⅝	6	6⅞	20	10⅛	6	10⅞	21	10¾
5	11	18	9⅜	6	3	19	10	6	7	20	10½	6	11	21	11⅛
5	11⅛	18	9¾	6	3⅛	19	10⅜	6	7⅛	20	10⅞	6	11⅛	21	11½
5	11¼	18	10⅛	6	3¼	19	10¾	6	7¼	20	11⅜	6	11¼	21	11⅞
5	11⅜	18	10½	6	3⅜	19	11⅛	6	7⅜	20	11¾	6	11⅜	22	0¼
5	11½	18	11	6	3½	19	11½	6	7½	21	0⅛	6	11½	22	0⅝
5	11⅝	18	11⅜	6	3⅝	19	11⅞	6	7⅝	21	0½	6	11⅝	22	1
5	11¾	18	11¾	6	3¾	20	0⅜	6	7¾	21	0⅞	6	11¾	22	1½
5	11⅞	19	0⅛	6	3⅞	20	0¾	6	7⅞	21	1¼	6	11⅞	22	1⅞
6	0	19	0½	6	4	20	1⅛	6	8	21	1⅝	7	0	22	2¼
6	0⅛	19	0⅞	6	4⅛	20	1½	6	8⅛	21	2	7	0⅛	22	2⅝
6	0¼	19	1⅜	6	4¼	20	1⅞	6	8¼	21	2½	7	0¼	22	3
6	0⅜	19	1¾	6	4⅜	20	2¼	6	8⅜	21	2⅞	7	0⅜	22	3⅜
6	0½	19	2⅛	6	4½	20	2⅝	6	8½	21	3¼	7	0½	22	3⅞
6	0⅝	19	2½	6	4⅝	20	3	6	8⅝	21	3⅝	7	0⅝	22	4¼
6	0¾	19	2⅞	6	4¾	20	3½	6	8¾	21	4	7	0¾	22	4⅝
6	0⅞	19	3¼	6	4⅞	20	3⅞	6	8⅞	21	4⅜	7	0⅞	22	5
6	1	19	3⅝	6	5	20	4¼	6	9	21	4¾	7	1	22	5⅜
6	1⅛	19	4	6	5⅛	20	4⅝	6	9⅛	21	5⅛	7	1⅛	22	5¾
6	1¼	19	4½	6	5¼	20	5	6	9¼	21	5½	7	1¼	22	6⅛
6	1⅜	19	4⅞	6	5⅜	20	5⅜	6	9⅜	21	6	7	1⅜	22	6½
6	1½	19	5¼	6	5½	20	5⅞	6	9½	21	6⅜	7	1½	22	7
6	1⅝	19	5⅝	6	5⅝	20	6¼	6	9⅝	21	6¾	7	1⅝	22	7⅜
6	1¾	19	6	6	5¾	20	6⅝	6	9¾	21	7⅛	7	1¾	22	7¾
6	1⅞	19	6⅜	6	5⅞	20	7	6	9⅞	21	7⅝	7	1⅞	22	8⅛

For ANGLE IRON measuring $\frac{3}{8}$ of an Inch thick, diagonally across the root.

FLANGE OUTSIDE.

INSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.		INSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.		INSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.		INSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.	
FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.
7	2	22	$8\frac{1}{2}$	7	6	23	$9\frac{1}{8}$	7	10	24	$9\frac{5}{8}$	8	2	25	$10\frac{1}{4}$
7	$2\frac{1}{8}$	22	$8\frac{7}{8}$	7	$6\frac{1}{8}$	23	$9\frac{1}{2}$	7	$10\frac{1}{8}$	24	10	8	$2\frac{1}{8}$	25	$10\frac{5}{8}$
7	$2\frac{1}{4}$	22	$9\frac{1}{4}$	7	$6\frac{1}{4}$	23	$9\frac{7}{8}$	7	$10\frac{1}{4}$	24	$10\frac{1}{2}$	8	$2\frac{1}{4}$	25	11
7	$2\frac{3}{8}$	22	$9\frac{3}{4}$	7	$6\frac{3}{8}$	23	$10\frac{1}{4}$	7	$10\frac{3}{8}$	24	$10\frac{7}{8}$	8	$2\frac{3}{8}$	25	$11\frac{3}{8}$
7	$2\frac{1}{2}$	22	$10\frac{1}{8}$	7	$6\frac{1}{2}$	23	$10\frac{5}{8}$	7	$10\frac{1}{2}$	24	$11\frac{1}{4}$	8	$2\frac{1}{2}$	25	$11\frac{3}{4}$
7	$2\frac{5}{8}$	22	$10\frac{1}{2}$	7	$6\frac{5}{8}$	23	11	7	$10\frac{5}{8}$	24	$11\frac{5}{8}$	8	$2\frac{5}{8}$	26	$0\frac{1}{8}$
7	$2\frac{3}{4}$	22	$10\frac{7}{8}$	7	$6\frac{3}{4}$	23	$11\frac{1}{2}$	7	$10\frac{3}{4}$	25	0	8	$2\frac{3}{4}$	26	$0\frac{5}{8}$
7	$2\frac{7}{8}$	22	$11\frac{1}{4}$	7	$6\frac{7}{8}$	23	$11\frac{7}{8}$	7	$10\frac{7}{8}$	25	$0\frac{3}{8}$	8	$2\frac{7}{8}$	26	1
7	3	22	$11\frac{5}{8}$	7	7	24	$0\frac{1}{4}$	7	11	25	$0\frac{3}{4}$	8	3	26	$1\frac{3}{8}$
7	$3\frac{1}{8}$	23	0	7	$7\frac{1}{8}$	24	$0\frac{5}{8}$	7	$11\frac{1}{8}$	25	$1\frac{1}{4}$	8	$3\frac{1}{8}$	26	$1\frac{3}{4}$
7	$3\frac{1}{4}$	23	$0\frac{1}{2}$	7	$7\frac{1}{4}$	24	1	7	$11\frac{1}{4}$	25	$1\frac{5}{8}$	8	$3\frac{1}{4}$	26	$2\frac{1}{8}$
7	$3\frac{3}{8}$	23	$0\frac{7}{8}$	7	$7\frac{3}{8}$	24	$1\frac{3}{8}$	7	$11\frac{3}{8}$	25	2	8	$3\frac{3}{8}$	26	$2\frac{1}{2}$
7	$3\frac{1}{2}$	23	$1\frac{1}{4}$	7	$7\frac{1}{2}$	24	$1\frac{3}{4}$	7	$11\frac{1}{2}$	25	$2\frac{3}{8}$	8	$3\frac{1}{2}$	26	$2\frac{7}{8}$
7	$3\frac{5}{8}$	23	$1\frac{5}{8}$	7	$7\frac{5}{8}$	24	$2\frac{1}{4}$	7	$11\frac{5}{8}$	25	$2\frac{3}{4}$	8	$3\frac{5}{8}$	26	$3\frac{3}{8}$
7	$3\frac{3}{4}$	23	2	7	$7\frac{3}{4}$	24	$2\frac{5}{8}$	7	$11\frac{3}{4}$	25	$3\frac{1}{8}$	8	$3\frac{3}{4}$	26	$3\frac{3}{4}$
7	$3\frac{7}{8}$	23	$2\frac{3}{8}$	7	$7\frac{7}{8}$	24	3	7	$11\frac{7}{8}$	25	$3\frac{1}{2}$	8	$3\frac{7}{8}$	26	$4\frac{1}{8}$
7	4	23	$2\frac{3}{4}$	7	8	24	$3\frac{3}{8}$	8	0	25	$3\frac{7}{8}$	8	4	26	$4\frac{1}{2}$
7	$4\frac{1}{8}$	23	$3\frac{1}{4}$	7	$8\frac{1}{8}$	24	$3\frac{3}{4}$	8	$0\frac{1}{8}$	25	$4\frac{3}{8}$	8	$4\frac{1}{8}$	26	$4\frac{7}{8}$
7	$4\frac{1}{4}$	23	$3\frac{5}{8}$	7	$8\frac{1}{4}$	24	$4\frac{1}{8}$	8	$0\frac{1}{4}$	25	$4\frac{3}{4}$	8	$4\frac{1}{4}$	26	$5\frac{1}{4}$
7	$4\frac{3}{8}$	23	4	7	$8\frac{3}{8}$	24	$4\frac{1}{2}$	8	$0\frac{3}{8}$	25	$5\frac{1}{8}$	8	$4\frac{3}{8}$	26	$5\frac{5}{8}$
7	$4\frac{1}{2}$	23	$4\frac{3}{8}$	7	$8\frac{1}{2}$	24	$4\frac{7}{8}$	8	$0\frac{1}{2}$	25	$5\frac{1}{2}$	8	$4\frac{1}{2}$	26	6
7	$4\frac{5}{8}$	23	$4\frac{3}{4}$	7	$8\frac{5}{8}$	24	$5\frac{3}{8}$	8	$0\frac{5}{8}$	25	$5\frac{7}{8}$	8	$4\frac{5}{8}$	26	$6\frac{1}{2}$
7	$4\frac{3}{4}$	23	$5\frac{1}{8}$	7	$8\frac{3}{4}$	24	$5\frac{3}{4}$	8	$0\frac{3}{4}$	25	$6\frac{1}{4}$	8	$4\frac{3}{4}$	26	$6\frac{7}{8}$
7	$4\frac{7}{8}$	23	$5\frac{1}{2}$	7	$8\frac{7}{8}$	24	$6\frac{1}{8}$	8	$0\frac{7}{8}$	25	$6\frac{5}{8}$	8	$4\frac{7}{8}$	26	$7\frac{1}{4}$
7	5	23	6	7	9	24	$6\frac{1}{2}$	8	1	25	7	8	5	26	$7\frac{5}{8}$
7	$5\frac{1}{8}$	23	$6\frac{3}{8}$	7	$9\frac{1}{8}$	24	$6\frac{7}{8}$	8	$1\frac{1}{8}$	25	$7\frac{1}{2}$	8	$5\frac{1}{8}$	26	8
7	$5\frac{1}{4}$	23	$6\frac{3}{4}$	7	$9\frac{1}{4}$	24	$7\frac{1}{4}$	8	$1\frac{1}{4}$	25	$7\frac{7}{8}$	8	$5\frac{1}{4}$	26	$8\frac{3}{8}$
7	$5\frac{3}{8}$	23	$7\frac{1}{8}$	7	$9\frac{3}{8}$	24	$7\frac{5}{8}$	8	$1\frac{3}{8}$	25	$8\frac{1}{4}$	8	$5\frac{3}{8}$	26	$8\frac{7}{8}$
7	$5\frac{1}{2}$	23	$7\frac{1}{2}$	7	$9\frac{1}{2}$	24	8	8	$1\frac{1}{2}$	25	$8\frac{5}{8}$	8	$5\frac{1}{2}$	26	$9\frac{1}{4}$
7	$5\frac{5}{8}$	23	$7\frac{7}{8}$	7	$9\frac{5}{8}$	24	$8\frac{1}{2}$	8	$1\frac{5}{8}$	25	9	8	$5\frac{5}{8}$	26	$9\frac{5}{8}$
7	$5\frac{3}{4}$	23	$8\frac{1}{4}$	7	$9\frac{3}{4}$	24	$8\frac{7}{8}$	8	$1\frac{3}{4}$	25	$9\frac{1}{2}$	8	$5\frac{3}{4}$	26	10
7	$5\frac{7}{8}$	23	$8\frac{3}{4}$	7	$9\frac{7}{8}$	24	$9\frac{1}{4}$	8	$1\frac{7}{8}$	25	$9\frac{7}{8}$	8	$5\frac{7}{8}$	26	$10\frac{3}{8}$

TABLE III.,

For Angle Iron measuring ½ of an Inch thick, diagonally across the root.

FLANGE OUTSIDE.

INSIDE DIAMETER OF RING.	LENGTH REQUIRED FOR RING.	INSIDE DIAMETER OF RING.	LENGTH REQUIRED FOR RING.	INSIDE DIAMETER OF RING.	LENGTH REQUIRED FOR RING.	INSIDE DIAMETER OF RING.	LENGTH REQUIRED FOR RING.
FT. IN.	FT. IN.	FT. IN.	FT. IN.	FT. IN.	FT. IN.	FT. IN.	FT. IN.
6	1 10	0 10	2 10½	1 2	3 11⅛	1 6	4 11⅝
6⅛	1 10⅜	0 10⅛	2 10⅞	1 2⅛	3 11½	1 6⅛	5 0
6¼	1 10¾	0 10¼	2 11⅜	1 2¼	3 11⅞	1 6¼	5 0⅜
6⅜	1 11⅛	0 10⅜	2 11¾	1 2⅜	4 0¼	1 6⅜	5 0⅞
6½	1 11½	0 10½	3 0⅛	1 2½	4 0⅝	1 6½	5 1¼
6⅝	1 11⅞	0 10⅝	3 0½	1 2⅝	4 1	1 6⅝	5 1⅝
6¾	2 0⅜	0 10¾	3 0⅞	1 2¾	4 1⅜	1 6¾	5 2
6⅞	2 0¾	0 10⅞	3 1¼	1 2⅞	4 1⅞	1 6⅞	5 2⅜
7	2 1⅛	0 11	3 1⅝	1 3	4 2¼	1 7	5 2¾
7⅛	2 1½	0 11⅛	3 2	1 3⅛	4 2⅝	1 7⅛	5 3⅛
7¼	2 1⅞	0 11¼	3 2½	1 3¼	4 3	1 7¼	5 3⅝
7⅜	2 2⅜	0 11⅜	3 2⅞	1 3⅜	4 3⅜	1 7⅜	5 4
7½	2 2¾	0 11½	3 3¼	1 3½	4 3¾	1 7½	5 4⅜
7⅝	2 3⅛	0 11⅝	3 3⅝	1 3⅝	4 4⅛	1 7⅝	5 4¾
7¾	2 3½	0 11¾	3 4	1 3¾	4 4½	1 7¾	5 5⅛
7⅞	2 3⅞	0 11⅞	3 4⅜	1 3⅞	4 5	1 7⅞	5 5½
8	2 4¼	1 0	3 4⅞	1 4	4 5⅜	1 8	5 5⅞
8⅛	2 4⅝	1 0⅛	3 5¼	1 4⅛	4 5¾	1 8⅛	5 6⅜
8¼	2 5	1 0¼	3 5⅝	1 4¼	4 6⅛	1 8¼	5 6¾
8⅜	2 5½	1 0⅜	3 6	1 4⅜	4 6½	1 8⅜	5 7⅛
8½	2 5⅞	1 0½	3 6⅜	1 4½	4 7	1 8½	5 7½
8⅝	2 6¼	1 0⅝	3 6¾	1 4⅝	4 7⅜	1 8⅝	5 8
8¾	2 6⅝	1 0¾	3 7⅛	1 4¾	4 7¾	1 8¾	5 8⅜
8⅞	2 7	1 0⅞	3 7⅝	1 4⅞	4 8⅛	1 8⅞	5 8¾
9	2 7⅜	1 1	3 8	1 5	4 8½	1 9	5 9⅛
9⅛	2 7¾	1 1⅛	3 8⅜	1 5⅛	4 8⅞	1 9⅛	5 9½
9¼	2 8¼	1 1¼	3 8¾	1 5¼	4 9¼	1 9¼	5 9⅞
9⅜	2 8⅝	1 1⅜	3 9⅛	1 5⅜	4 9⅝	1 9⅜	5 10¼
9½	2 9	1 1½	3 9½	1 5½	4 10⅛	1 9½	5 10⅝
9⅝	2 9⅜	1 1⅝	3 9⅞	1 5⅝	4 10½	1 9⅝	5 11
9¾	2 9¾	1 1¾	3 10⅜	1 5¾	4 10⅞	1 9¾	5 11½
9⅞	2 10⅛	1 1⅞	3 10¾	1 5⅞	4 11¼	1 9⅞	5 11⅞

For Angle Iron measuring ½ Inch thick, diagonally across the root.

FLANGE OUTSIDE.

Inside Diameter of Ring.		Length required for Ring.		Inside Diameter of Ring.		Length required for Ring.		Inside Diameter of Ring.		Length required for Ring.		Inside Diameter of Ring.		Length required for Ring.	
Ft.	In.	Ft.	In.	Ft.	In.	Ft.	In.	Ft.	In.	Ft.	In.	Ft.	In.	Ft.	In.
1	10	6	0¼	2	2	7	0¾	2	6	8	1⅜	2	10	9	1⅞
1	10⅛	6	0⅝	2	2⅛	7	1⅛	2	6⅛	8	1¾	2	10⅛	9	2⅜
1	10¼	6	1	2	2¼	7	1½	2	6¼	8	2⅛	2	10¼	9	2¾
1	10⅜	6	1⅜	2	2⅜	7	2	2	6⅜	8	2½	2	10⅜	9	3⅛
1	10½	6	1¾	2	2½	7	2⅜	2	6½	8	2⅞	2	10½	9	3½
1	10⅝	6	2¼	2	2⅝	7	2¾	2	6⅝	8	3⅜	2	10⅝	9	3⅞
1	10¾	6	2⅝	2	2¾	7	3⅛	2	6¾	8	3¾	2	10¾	9	4¼
1	10⅞	6	3	2	2⅞	7	3½	2	6⅞	8	4⅛	2	10⅞	9	4⅝
1	11	6	3⅜	2	3	7	3⅞	2	7	8	4½	2	11	9	5
1	11⅛	6	3¾	2	3⅛	7	4⅜	2	7⅛	8	4⅞	2	11⅛	9	5½
1	11¼	6	4⅛	2	3¼	7	4¾	2	7¼	8	5¼	2	11¼	9	5⅞
1	11⅜	6	4½	2	3⅜	7	5⅛	2	7⅜	8	5⅝	2	11⅜	9	6¼
1	11½	6	4⅞	2	3½	7	5½	2	7½	8	6	2	11½	9	6⅝
1	11⅝	6	5⅜	2	3⅝	7	5⅞	2	7⅝	8	6½	2	11⅝	9	7
1	11¾	6	5¾	2	3¾	7	6¼	2	7¾	8	6⅞	2	11¾	9	7⅜
1	11⅞	6	6⅛	2	3⅞	7	6⅝	2	7⅞	8	7¼	2	11⅞	9	7⅞
2	0	6	6½	2	4	7	7	2	8	8	7⅝	3	0	9	8¼
2	0⅛	6	6⅞	2	4⅛	7	7½	2	8⅛	8	8	3	0⅛	9	8⅝
2	0¼	6	7¼	2	4¼	7	7⅞	2	8¼	8	8⅜	3	0¼	9	9
2	0⅜	6	7⅝	2	4⅜	7	8¼	2	8⅜	8	8⅞	3	0⅜	9	9⅜
2	0½	6	8⅛	2	4½	7	8⅝	2	8½	8	9¼	3	0½	9	9¾
2	0⅝	6	8½	2	4⅝	7	9	2	8⅝	8	9⅝	3	0⅝	9	10⅛
2	0¾	6	8⅞	2	4¾	7	9⅜	2	8¾	8	10	3	0¾	9	10½
2	0⅞	6	9¼	2	4⅞	7	9¾	2	8⅞	8	10⅜	3	0⅞	9	10⅞
2	1	6	9⅝	2	5	7	10¼	2	9	8	10¾	3	1	9	11⅜
2	1⅛	6	10	2	5⅛	7	10⅝	2	9⅛	8	11⅛	3	1⅛	9	11¾
2	1¼	6	10½	2	5¼	7	11	2	9¼	8	11½	3	1¼	10	0⅛
2	1⅜	6	10⅞	2	5⅜	7	11⅜	2	9⅜	9	0	3	1⅜	10	0½
2	1½	6	11¼	2	5½	7	11¾	2	9½	9	0⅜	3	1½	10	0⅞
2	1⅝	6	11⅝	2	5⅝	8	0⅛	2	9⅝	9	0¾	3	1⅝	10	1⅜
2	1¾	7	0	2	5¾	8	0½	2	9¾	9	1⅛	3	1¾	10	1¾
2	1⅞	7	0⅜	2	5⅞	8	1	2	9⅞	9	1½	3	1⅞	10	2⅛

For Angle Iron measuring ¼ Inch thick, diagonally across the root.

FLANGE OUTSIDE.

INSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.		INSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.		INSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.		INSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.	
FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.
3	2	10	2½	3	6	11	3	3	10	12	3⅝	4	2	13	4¼
3	2⅛	10	2⅞	3	6⅛	11	3½	3	10⅛	12	4	4	2⅛	13	4⅝
3	2¼	10	3¼	3	6¼	11	3⅞	3	10¼	12	4⅜	4	2¼	13	5
3	2⅜	10	3⅝	3	6⅜	11	4¼	3	10⅜	12	4¾	4	2⅜	13	5⅜
3	2½	10	4	3	6½	11	4⅝	3	10½	12	5¼	4	2½	13	5¾
3	2⅝	10	4½	3	6⅝	11	5	3	10⅝	12	5⅝	4	2⅝	13	6⅛
3	2¾	10	4⅞	3	6¾	11	5⅜	3	10¾	12	6	4	2¾	13	6½
3	2⅞	10	5¼	3	6⅞	11	5¾	3	10⅞	12	6⅜	4	2⅞	13	7
3	3	10	5⅝	3	7	11	6¼	3	11	12	6¾	4	3	13	7⅜
3	3⅛	10	6	3	7⅛	11	6⅝	3	11⅛	12	7⅛	4	3⅛	13	7¾
3	3¼	10	6⅜	3	7¼	11	7	3	11¼	12	7½	4	3¼	13	8⅛
3	3⅜	10	6⅞	3	7⅜	11	7⅜	3	11⅜	12	7⅞	4	3⅜	13	8½
3	3½	10	7¼	3	7½	11	7¾	3	11½	12	8⅜	4	3½	13	8⅞
3	3⅝	10	7⅝	3	7⅝	11	8⅛	3	11⅝	12	8¾	4	3⅝	13	9¼
3	3¾	10	8	3	7¾	11	8½	3	11¾	12	9⅛	4	3¾	13	9⅝
3	3⅞	10	8⅜	3	7⅞	11	8⅞	3	11⅞	12	9½	4	3⅞	13	10⅛
3	4	10	8¾	3	8	11	9⅜	4	0	12	9⅞	4	4	13	10½
3	4⅛	10	9⅛	3	8⅛	11	9¾	4	0⅛	12	10⅜	4	4⅛	13	10⅞
3	4¼	10	9½	3	8¼	11	10⅛	4	0¼	12	10¾	4	4¼	13	11¼
3	4⅜	10	9⅞	3	8⅜	11	10½	4	0⅜	12	11⅛	4	4⅜	13	11⅝
3	4½	10	10⅜	3	8½	11	10⅞	4	0½	12	11½	4	4½	14	0
3	4⅝	10	10¾	3	8⅝	11	11¼	4	0⅝	12	11⅞	4	4⅝	14	0⅜
3	4¾	10	11⅛	3	8¾	11	11⅝	4	0¾	13	0¼	4	4¾	14	0⅞
3	4⅞	10	11½	3	8⅞	12	0⅛	4	0⅞	13	0⅝	4	4⅞	14	1¼
3	5	10	11⅞	3	9	12	0½	4	1	13	1	4	5	14	1⅝
3	5⅛	11	0⅜	3	9⅛	12	0⅞	4	1⅛	13	1½	4	5⅛	14	2
3	5¼	11	0¾	3	9¼	12	1¼	4	1¼	13	1⅞	4	5¼	14	2⅜
3	5⅜	11	1⅛	3	9⅜	12	1⅝	4	1⅜	13	2¼	4	5⅜	14	2¾
3	5½	11	1½	3	9½	12	2	4	1½	13	2⅝	4	5½	14	3⅛
3	5⅝	11	1⅞	3	9⅝	12	2⅜	4	1⅝	13	3	4	5⅝	14	3½
3	5¾	11	2¼	3	9¾	12	2⅞	4	1¾	13	3⅜	4	5¾	14	4
3	5⅞	11	2⅝	3	9⅞	12	3¼	4	1⅞	13	3¾	4	5⅞	14	4⅜

For Angle Iron measuring ½ Inch thick, diagonally across the root.

FLANGE OUTSIDE.

INSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.		INSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.		INSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.		INSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.	
FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.
4	6	14	4¾	4	10	15	5⅜	5	2	16	5⅞	5	6	17	6½
4	6⅛	14	5⅛	4	10⅛	15	5¾	5	2⅛	16	6¼	5	6⅛	17	6⅞
4	6¼	14	5½	4	10¼	15	6⅛	5	2¼	16	6⅝	5	6¼	17	7¼
4	6⅜	14	5⅞	4	10⅜	15	6½	5	2⅜	16	7	5	6⅜	17	7⅝
4	6½	14	6⅜	4	10½	15	6⅞	5	2½	16	7½	5	6½	17	8
4	6⅝	14	6¾	4	10⅝	15	7¼	5	2⅝	16	7⅞	5	6⅝	17	8⅜
4	6¾	14	7⅛	4	10¾	15	7¾	5	2¾	16	8¼	5	6¾	17	8⅞
4	6⅞	14	7½	4	10⅞	15	8⅛	5	2⅞	16	8⅝	5	6⅞	17	9¼
4	7	14	7⅞	4	11	15	8½	5	3	16	9	5	7	17	9⅝
4	7⅛	14	8¼	4	11⅛	15	8⅞	5	3⅛	16	9⅜	5	7⅛	17	10
4	7¼	14	8¾	4	11¼	15	9¼	5	3¼	16	9⅞	5	7¼	17	10⅜
4	7⅜	14	9⅛	4	11⅜	15	9⅝	5	3⅜	16	10¼	5	7⅜	17	10¾
4	7½	14	9½	4	11½	15	10	5	3½	16	10⅝	5	7½	17	11⅛
4	7⅝	14	9⅞	4	11⅝	15	10⅜	5	3⅝	16	11	5	7⅝	17	11½
4	7¾	14	10¼	4	11¾	15	10⅞	5	3¾	16	11⅜	5	7¾	18	0
4	7⅞	14	10⅝	4	11⅞	15	11¼	5	3⅞	16	11¾	5	7⅞	18	0⅜
4	8	14	11	5	0	15	11⅝	5	4	17	0⅛	5	8	18	0¾
4	8⅛	14	11½	5	0⅛	16	0	5	4⅛	17	0⅝	5	8⅛	18	1⅛
4	8¼	14	11⅞	5	0¼	16	0⅜	5	4¼	17	1	5	8¼	18	1½
4	8⅜	15	0¼	5	0⅜	16	0¾	5	4⅜	17	1⅜	5	8⅜	18	1⅞
4	8½	15	0⅝	5	0½	16	1⅛	5	4½	17	1¾	5	8½	18	2⅜
4	8⅝	15	1	5	0⅝	16	1⅝	5	4⅝	17	2⅛	5	8⅝	18	2¾
4	8¾	15	1⅜	5	0¾	16	2	5	4¾	17	2½	5	8¾	18	3⅛
4	8⅞	15	1⅞	5	0⅞	16	2⅜	5	4⅞	17	2⅞	5	8⅞	18	3½
4	9	15	2¼	5	1	16	2¾	5	5	17	3⅜	5	9	18	3⅞
4	9⅛	15	2⅝	5	1⅛	16	3⅛	5	5⅛	17	3¾	5	9⅛	18	4¼
4	9¼	15	3	5	1¼	16	3½	5	5¼	17	4⅛	5	9¼	18	4⅝
4	9⅜	15	3⅜	5	1⅜	16	3⅞	5	5⅜	17	4½	5	9⅜	18	5
4	9½	15	3¾	5	1½	16	4⅜	5	5½	17	4⅞	5	9½	18	5½
4	9⅝	15	4⅛	5	1⅝	16	4¾	5	5⅝	17	5¼	5	9⅝	18	5⅞
4	9¾	15	4½	5	1¾	16	5⅛	5	5¾	17	5⅝	5	9¾	18	6¼
4	9⅞	15	4⅞	5	1⅞	16	5½	5	5⅞	17	6	5	9⅞	18	6⅝

For Angle Iron measuring ¼ Inch thick, diagonally across the root.

FLANGE OUTSIDE.

INSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.		INSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.		INSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.		INSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.	
FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.
5	10	18	7	6	2	19	7⅞	6	6	20	8⅛	6	10	21	8¾
5	10⅛	18	7⅜	6	2⅛	19	8	6	6⅛	20	8½	6	10⅛	21	9⅛
5	10¼	18	7⅞	6	2¼	19	8⅜	6	6¼	20	9	6	10¼	21	9½
5	10⅜	18	8¼	6	2⅜	19	8¾	6	6⅜	20	9⅜	6	10⅜	21	9⅞
5	10½	18	8⅝	6	2½	19	9⅛	6	6½	20	9¾	6	10½	21	10⅜
5	10⅝	18	9	6	2⅝	19	9⅝	6	6⅝	20	10⅛	6	10⅝	21	10¾
5	10¾	18	9⅜	6	2¾	19	10	6	6¾	20	10½	6	10¾	21	11⅛
5	10⅞	18	9¾	6	2⅞	19	10⅜	6	6⅞	20	10⅞	6	10⅞	21	11½
5	11	18	10⅛	6	3	19	10¾	6	7	20	11⅜	6	11	21	11⅞
5	11⅛	18	10½	6	3⅛	19	11⅛	6	7⅛	20	11¾	6	11⅛	22	0¼
5	11¼	18	11	6	3¼	19	11½	6	7¼	21	0⅛	6	11¼	22	0⅝
5	11⅜	18	11⅜	6	3⅜	19	11⅞	6	7⅜	21	0½	6	11⅜	22	1
5	11½	18	11¾	6	3½	20	0⅜	6	7½	21	0⅞	6	11½	22	1½
5	11⅝	19	0⅛	6	3⅝	20	0¾	6	7⅝	21	1¼	6	11⅝	22	1⅞
5	11¾	19	0½	6	3¾	20	1⅛	6	7¾	21	1⅝	6	11¾	22	2¼
5	11⅞	19	0⅞	6	3⅞	20	1½	6	7⅞	21	2	6	11⅞	22	2⅝
6	0	19	1⅜	6	4	20	1⅞	6	8	21	2½	7	0	22	3
6	0⅛	19	1¾	6	4⅛	20	2¼	6	8⅛	21	2⅞	7	0⅛	22	3⅜
6	0¼	19	2⅛	6	4¼	20	2⅝	6	8¼	21	3¼	7	0¼	22	3⅞
6	0⅜	19	2¼	6	4⅜	20	3	6	8⅜	21	3⅝	7	0⅜	22	4¼
6	0½	19	2⅞	6	4½	20	3½	6	8½	21	4	7	0½	22	4⅝
6	0⅝	19	3¼	6	4⅝	20	3⅞	6	8⅝	21	4⅜	7	0⅝	22	5
6	0¾	19	3⅝	6	4¾	20	4¼	6	8⅜	21	4¾	7	0¾	22	5⅜
6	0⅞	19	4	6	4⅞	20	4⅝	6	8⅞	21	5⅛	7	0⅞	22	5¾
6	1	19	4½	6	5	20	5	6	9	21	5½	7	1	22	6⅛
6	1⅛	19	4⅞	6	5⅛	20	5⅜	6	9⅛	21	6	7	1⅛	22	6½
6	1¼	19	5¼	6	5¼	20	5⅞	6	9¼	21	6⅜	7	1¼	22	7
6	1⅜	19	5⅝	6	5⅜	20	6	6	9⅜	21	6¾	7	1⅜	22	7⅜
6	1½	19	6	6	5½	20	6⅝	6	9½	21	7⅛	7	1½	22	7¾
6	1⅝	19	6⅜	6	5⅝	20	7	6	9⅝	21	7⅝	7	1⅝	22	8⅛
6	1¾	19	6⅞	6	5¾	20	7⅜	6	9¾	21	8	7	1¾	22	8½
6	1⅞	19	7¼	6	5⅞	20	7¾	6	9⅞	21	8⅜	7	1⅞	22	8⅞

For Angle Iron measuring ½ Inch thick, diagonally across the root.

FLANGE OUTSIDE.

INSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.		INSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.		INSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.		INSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.	
FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.
7	2	22	9¼	7	6	23	9⅞	7	10	24	10½	8	2	25	11
7	2⅛	22	9¾	7	6⅛	23	10¼	7	10⅛	24	10⅞	8	2⅛	25	11⅜
7	2¼	22	10⅛	7	6¼	23	10⅝	7	10¼	24	11¼	8	2¼	25	11¾
7	2⅜	22	10½	7	6⅜	23	11	7	10⅜	24	11⅝	8	2⅜	26	0⅛
7	2½	22	10⅞	7	6½	23	11½	7	10½	25	0	8	2½	26	0⅝
7	2⅝	22	11¼	7	6⅝	23	11⅞	7	10⅝	25	0⅜	8	2⅝	26	1
7	2¾	22	11⅝	7	6¾	24	0¼	7	10¾	25	0¾	8	2¾	26	1⅜
7	2⅞	23	0	7	6⅞	24	0⅝	7	10⅞	25	1¼	8	2⅞	26	1¾
7	3	23	0½	7	7	24	1	7	11	25	1⅝	8	3	26	2⅛
7	3⅛	23	0⅞	7	7⅛	24	1⅜	7	11⅛	25	2	8	3⅛	26	2½
7	3¼	23	1¼	7	7¼	24	1¾	7	11¼	25	2⅜	8	3¼	26	2⅞
7	3⅜	23	1⅝	7	7⅜	24	2¼	7	11⅜	25	2¾	8	3⅜	26	3⅜
7	3½	23	2	7	7½	24	2⅝	7	11½	25	3⅛	8	3½	26	3¾
7	3⅝	23	2⅜	7	7⅝	24	3	7	11⅝	25	3½	8	3⅝	26	4⅛
7	3¾	23	2¾	7	7¾	24	3⅜	7	11¾	25	3⅞	8	3¾	26	4½
7	3⅞	23	3¼	7	7⅞	24	3¾	7	11⅞	25	4⅜	8	3⅞	26	4⅞
7	4	23	3⅝	7	8	24	4⅛	8	0	25	4¾	8	4	26	5¼
7	4⅛	23	4	7	8⅛	24	4½	8	0⅛	25	5⅛	8	4⅛	26	5⅝
7	4¼	23	4⅜	7	8¼	24	4⅞	8	0¼	25	5½	8	4¼	26	6
7	4⅜	23	4¾	7	8⅜	24	5⅜	8	0⅜	25	5⅞	8	4⅜	26	6½
7	4½	23	5⅛	7	8½	24	5¾	8	0½	25	6¼	8	4½	26	6⅞
7	4⅝	23	5½	7	8⅝	24	6⅛	8	0⅝	25	6⅝	8	4⅝	26	7¼
7	4¾	23	6	7	8¾	24	6½	8	0¾	25	7	8	4¾	26	7⅝
7	4⅞	23	6⅜	7	8⅞	24	6⅞	8	0⅞	25	7½	8	4⅞	26	8
7	5	23	6¾	7	9	24	7¼	8	1	25	7⅞	8	5	26	8⅜
7	5⅛	23	7⅛	7	9⅛	24	7⅝	8	1⅛	25	8¼	8	5⅛	26	8⅞
7	5¼	23	7½	7	9¼	24	8	8	1¼	25	8⅝	8	5¼	26	9¼
7	5⅜	23	7⅞	7	9⅜	24	8½	8	1⅜	25	9	8	5⅜	26	9⅝
7	5½	23	8¼	7	9½	24	8⅞	8	1½	25	9½	8	5½	26	10
7	5⅝	23	8¾	7	9⅝	24	9¼	8	1⅝	25	9⅞	8	5⅝	26	10⅜
7	5¾	23	9⅛	7	9¾	24	9⅝	8	1¾	25	10¼	8	5¾	26	10¾
7	5⅞	23	9½	7	9⅞	24	10	8	1⅞	25	10⅝	8	5⅞	26	11⅛

TABLE IV.,

For Angle Iron measuring $\frac{5}{8}$ of an Inch thick, diagonally across the root.

FLANGE OUTSIDE.

INSIDE DIAMETER OF RING.	LENGTH REQUIRED FOR RING.		INSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.		INSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.		INSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.	
IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.
6	1	$10\frac{3}{4}$	0	10	2	$11\frac{3}{8}$	1	2	3	$11\frac{7}{8}$	1	6	5	$0\frac{3}{8}$
$6\frac{1}{8}$	1	$11\frac{1}{8}$	0	$10\frac{1}{8}$	2	$11\frac{3}{4}$	1	$2\frac{1}{8}$	4	$0\frac{1}{4}$	1	$6\frac{1}{8}$	5	$0\frac{7}{8}$
$6\frac{1}{4}$	1	$11\frac{1}{2}$	0	$10\frac{1}{4}$	3	$0\frac{1}{8}$	1	$2\frac{1}{4}$	4	$0\frac{5}{8}$	1	$6\frac{1}{4}$	5	$1\frac{1}{4}$
$6\frac{3}{8}$	1	$11\frac{7}{8}$	0	$10\frac{3}{8}$	3	$0\frac{1}{2}$	1	$2\frac{3}{8}$	4	1	1	$6\frac{3}{8}$	5	$1\frac{5}{8}$
$6\frac{1}{2}$	2	$0\frac{3}{8}$	0	$10\frac{1}{2}$	3	$0\frac{7}{8}$	1	$2\frac{1}{2}$	4	$1\frac{3}{8}$	1	$6\frac{1}{2}$	5	2
$6\frac{5}{8}$	2	$0\frac{3}{4}$	0	$10\frac{5}{8}$	3	$1\frac{1}{4}$	1	$2\frac{5}{8}$	4	$1\frac{7}{8}$	1	$6\frac{5}{8}$	5	$2\frac{3}{8}$
$6\frac{3}{4}$	2	$1\frac{1}{8}$	0	$10\frac{3}{4}$	3	$1\frac{5}{8}$	1	$2\frac{3}{4}$	4	$2\frac{1}{4}$	1	$6\frac{3}{4}$	5	$2\frac{3}{4}$
$6\frac{7}{8}$	2	$1\frac{1}{2}$	0	$10\frac{7}{8}$	3	2	1	$2\frac{7}{8}$	4	$2\frac{5}{8}$	1	$6\frac{7}{8}$	5	$3\frac{1}{8}$
7	2	$1\frac{7}{8}$	0	11	3	$2\frac{1}{2}$	1	3	4	3	1	7	5	$3\frac{5}{8}$
$7\frac{1}{8}$	2	$2\frac{3}{8}$	0	$11\frac{1}{8}$	3	$2\frac{7}{8}$	1	$3\frac{1}{8}$	4	$3\frac{3}{8}$	1	$7\frac{1}{8}$	5	4
$7\frac{1}{4}$	2	$2\frac{3}{4}$	0	$11\frac{1}{4}$	3	$3\frac{1}{4}$	1	$3\frac{1}{4}$	4	$3\frac{3}{4}$	1	$7\frac{1}{4}$	5	$4\frac{3}{8}$
$7\frac{3}{8}$	2	$3\frac{1}{8}$	0	$11\frac{3}{8}$	3	$3\frac{5}{8}$	1	$3\frac{3}{8}$	4	$4\frac{1}{8}$	1	$7\frac{3}{8}$	5	$4\frac{3}{4}$
$7\frac{1}{2}$	2	$3\frac{1}{2}$	0	$11\frac{1}{2}$	3	4	1	$3\frac{1}{2}$	4	$4\frac{1}{2}$	1	$7\frac{1}{2}$	5	$5\frac{1}{8}$
$7\frac{5}{8}$	2	$3\frac{7}{8}$	0	$11\frac{5}{8}$	3	$4\frac{3}{8}$	1	$3\frac{5}{8}$	4	5	1	$7\frac{5}{8}$	5	$5\frac{1}{2}$
$7\frac{3}{4}$	2	$4\frac{1}{4}$	0	$11\frac{3}{4}$	3	$4\frac{7}{8}$	1	$3\frac{3}{4}$	4	$5\frac{3}{8}$	1	$7\frac{3}{4}$	5	$5\frac{7}{8}$
$7\frac{7}{8}$	2	$4\frac{5}{8}$	0	$11\frac{7}{8}$	3	$5\frac{1}{4}$	1	$3\frac{7}{8}$	4	$5\frac{3}{4}$	1	$7\frac{7}{8}$	5	$6\frac{3}{8}$
8	2	5	1	0	3	$5\frac{5}{8}$	1	4	4	$6\frac{1}{8}$	1	8	5	$6\frac{3}{4}$
$8\frac{1}{8}$	2	$5\frac{1}{2}$	1	$0\frac{1}{8}$	3	6	1	$4\frac{1}{8}$	4	$6\frac{1}{2}$	1	$8\frac{1}{8}$	5	$7\frac{1}{8}$
$8\frac{1}{4}$	2	$5\frac{7}{8}$	1	$0\frac{1}{4}$	3	$6\frac{3}{8}$	1	$4\frac{1}{4}$	4	7	1	$8\frac{1}{4}$	5	$7\frac{1}{2}$
$8\frac{3}{8}$	2	$6\frac{1}{4}$	1	$0\frac{3}{8}$	3	$6\frac{3}{4}$	1	$4\frac{3}{8}$	4	$7\frac{3}{8}$	1	$8\frac{3}{8}$	5	8
$8\frac{1}{2}$	2	$6\frac{5}{8}$	1	$0\frac{1}{2}$	3	$7\frac{1}{8}$	1	$4\frac{1}{2}$	4	$7\frac{3}{4}$	1	$8\frac{1}{2}$	5	$8\frac{3}{8}$
$8\frac{5}{8}$	2	7	1	$0\frac{5}{8}$	3	$7\frac{5}{8}$	1	$4\frac{5}{8}$	4	$8\frac{1}{8}$	1	$8\frac{5}{8}$	5	$8\frac{3}{4}$
$8\frac{3}{4}$	2	$7\frac{3}{8}$	1	$0\frac{3}{4}$	3	8	1	$4\frac{3}{4}$	4	$8\frac{1}{2}$	1	$8\frac{3}{4}$	5	$9\frac{1}{8}$
$8\frac{7}{8}$	2	$7\frac{3}{4}$	1	$0\frac{7}{8}$	3	$8\frac{3}{8}$	1	$4\frac{7}{8}$	4	$8\frac{7}{8}$	1	$8\frac{7}{8}$	5	$9\frac{1}{2}$
9	2	$8\frac{1}{4}$	1	1	3	$8\frac{3}{4}$	1	5	4	$9\frac{1}{4}$	1	9	5	$9\frac{7}{8}$
$9\frac{1}{8}$	2	$8\frac{5}{8}$	1	$1\frac{1}{8}$	3	$9\frac{1}{8}$	1	$5\frac{1}{8}$	4	$9\frac{5}{8}$	1	$9\frac{1}{8}$	5	$10\frac{1}{4}$
$9\frac{1}{4}$	2	9	1	$1\frac{1}{4}$	3	$9\frac{1}{2}$	1	$5\frac{1}{4}$	4	$10\frac{1}{8}$	1	$9\frac{1}{4}$	5	$10\frac{5}{8}$
$9\frac{3}{8}$	2	$9\frac{3}{8}$	1	$1\frac{3}{8}$	3	$9\frac{7}{8}$	1	$5\frac{3}{8}$	4	$10\frac{1}{2}$	1	$9\frac{3}{8}$	5	11
$9\frac{1}{2}$	2	$9\frac{3}{4}$	1	$1\frac{1}{2}$	3	$10\frac{3}{8}$	1	$5\frac{1}{2}$	4	$10\frac{7}{8}$	1	$9\frac{1}{2}$	5	$11\frac{1}{2}$
$9\frac{5}{8}$	2	$10\frac{1}{8}$	1	$1\frac{5}{8}$	3	$10\frac{3}{4}$	1	$5\frac{5}{8}$	4	$11\frac{1}{4}$	1	$9\frac{5}{8}$	5	$11\frac{7}{8}$
$9\frac{3}{4}$	2	$10\frac{1}{2}$	1	$1\frac{3}{4}$	3	$11\frac{1}{8}$	1	$5\frac{3}{4}$	4	$11\frac{5}{8}$	1	$9\frac{3}{4}$	6	$0\frac{1}{4}$
$9\frac{7}{8}$	2	$10\frac{7}{8}$	1	$1\frac{7}{8}$	3	$11\frac{1}{2}$	1	$5\frac{7}{8}$	5	0	1	$9\frac{7}{8}$	6	$0\frac{5}{8}$

For Angle Iron measuring $\frac{5}{8}$ of an Inch thick, diagonally across the root.

FLANGE OUTSIDE.

INSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.		INSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.		INSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.		INSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.	
FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.
1	10	6	1	2	2	7	$1\frac{1}{2}$	2	6	8	$2\frac{1}{8}$	2	10	9	$2\frac{3}{4}$
1	$10\frac{1}{8}$	6	$1\frac{3}{8}$	2	$2\frac{1}{8}$	7	2	2	$6\frac{1}{8}$	8	$2\frac{1}{2}$	2	$10\frac{1}{8}$	9	$3\frac{1}{8}$
1	$10\frac{1}{4}$	6	$1\frac{3}{4}$	2	$2\frac{1}{4}$	7	$2\frac{3}{8}$	2	$6\frac{1}{4}$	8	$2\frac{7}{8}$	2	$10\frac{1}{4}$	9	$3\frac{1}{2}$
1	$10\frac{3}{8}$	6	$2\frac{1}{4}$	2	$2\frac{3}{8}$	7	$2\frac{3}{4}$	2	$6\frac{3}{8}$	8	$3\frac{3}{8}$	2	$10\frac{3}{8}$	9	$3\frac{7}{8}$
1	$10\frac{1}{2}$	6	$2\frac{5}{8}$	2	$2\frac{1}{2}$	7	$3\frac{1}{8}$	2	$6\frac{1}{2}$	8	$3\frac{3}{4}$	2	$10\frac{1}{2}$	9	$4\frac{1}{4}$
1	$10\frac{5}{8}$	6	3	2	$2\frac{5}{8}$	7	$3\frac{1}{2}$	2	$6\frac{5}{8}$	8	$4\frac{1}{8}$	2	$10\frac{5}{8}$	9	$4\frac{5}{8}$
1	$10\frac{3}{4}$	6	$3\frac{3}{8}$	2	$2\frac{3}{4}$	7	$3\frac{7}{8}$	2	$6\frac{3}{4}$	8	$4\frac{1}{2}$	2	$10\frac{3}{4}$	9	5
1	$10\frac{7}{8}$	6	$3\frac{3}{4}$	2	$2\frac{7}{8}$	7	$4\frac{3}{8}$	2	$6\frac{7}{8}$	8	$4\frac{7}{8}$	2	$10\frac{7}{8}$	9	$5\frac{1}{2}$
1	11	6	$4\frac{1}{8}$	2	3	7	$4\frac{3}{4}$	2	7	8	$5\frac{1}{4}$	2	11	9	$5\frac{7}{8}$
1	$11\frac{1}{8}$	6	$4\frac{1}{2}$	2	$3\frac{1}{8}$	7	$5\frac{1}{8}$	2	$7\frac{1}{8}$	8	$5\frac{5}{8}$	2	$11\frac{1}{8}$	9	$6\frac{1}{4}$
1	$11\frac{1}{4}$	6	$4\frac{7}{8}$	2	$3\frac{1}{4}$	7	$5\frac{1}{2}$	2	$7\frac{1}{4}$	8	6	2	$11\frac{1}{4}$	9	$6\frac{5}{8}$
1	$11\frac{3}{8}$	6	$5\frac{3}{8}$	2	$3\frac{3}{8}$	7	$5\frac{7}{8}$	2	$7\frac{3}{8}$	8	$6\frac{1}{2}$	2	$11\frac{3}{8}$	9	7
1	$11\frac{1}{2}$	6	$5\frac{3}{4}$	2	$3\frac{1}{2}$	7	$6\frac{1}{4}$	2	$7\frac{1}{2}$	8	$6\frac{7}{8}$	2	$11\frac{1}{2}$	9	$7\frac{3}{8}$
1	$11\frac{5}{8}$	6	$6\frac{1}{8}$	2	$3\frac{5}{8}$	7	$6\frac{5}{8}$	2	$7\frac{5}{8}$	8	$7\frac{1}{4}$	2	$11\frac{5}{8}$	9	$7\frac{7}{8}$
1	$11\frac{3}{4}$	6	$6\frac{1}{2}$	2	$3\frac{3}{4}$	7	7	2	$7\frac{3}{4}$	8	$7\frac{5}{8}$	2	$11\frac{3}{4}$	9	$8\frac{1}{4}$
1	$11\frac{7}{8}$	6	$6\frac{7}{8}$	2	$3\frac{7}{8}$	7	$7\frac{1}{2}$	2	$7\frac{7}{8}$	8	8	2	$11\frac{7}{8}$	9	$8\frac{5}{8}$
2	0	6	$7\frac{1}{4}$	2	4	7	$7\frac{7}{8}$	2	8	8	$8\frac{3}{8}$	3	0	9	9
2	$0\frac{1}{8}$	6	$7\frac{5}{8}$	2	$4\frac{1}{8}$	7	$8\frac{1}{4}$	2	$8\frac{1}{8}$	8	$8\frac{7}{8}$	3	$0\frac{1}{8}$	9	$9\frac{3}{8}$
2	$0\frac{1}{4}$	6	$8\frac{1}{8}$	2	$4\frac{1}{4}$	7	$8\frac{5}{8}$	2	$8\frac{1}{4}$	8	$9\frac{1}{4}$	3	$0\frac{1}{4}$	9	$9\frac{3}{4}$
2	$0\frac{3}{8}$	6	$8\frac{1}{2}$	2	$4\frac{3}{8}$	7	9	2	$8\frac{3}{8}$	8	$9\frac{5}{8}$	3	$0\frac{3}{8}$	9	$10\frac{1}{8}$
2	$0\frac{1}{2}$	6	$8\frac{7}{8}$	2	$4\frac{1}{2}$	7	$9\frac{3}{8}$	2	$8\frac{1}{2}$	8	10	3	$0\frac{1}{2}$	9	$10\frac{1}{2}$
2	$0\frac{5}{8}$	6	$9\frac{1}{4}$	2	$4\frac{5}{8}$	7	$9\frac{3}{4}$	2	$8\frac{5}{8}$	8	$10\frac{3}{8}$	3	$0\frac{5}{8}$	9	$10\frac{7}{8}$
2	$0\frac{3}{4}$	6	$9\frac{5}{8}$	2	$4\frac{3}{4}$	7	$10\frac{1}{4}$	2	$8\frac{3}{4}$	8	$10\frac{3}{4}$	3	$0\frac{3}{4}$	9	$11\frac{3}{8}$
2	$0\frac{7}{8}$	6	10	2	$4\frac{7}{8}$	7	$10\frac{5}{8}$	2	$8\frac{7}{8}$	8	$11\frac{1}{8}$	3	$0\frac{7}{8}$	9	$11\frac{3}{4}$
2	1	6	$10\frac{1}{2}$	2	5	7	11	2	9	8	$11\frac{1}{2}$	3	1	10	$0\frac{1}{8}$
2	$1\frac{1}{8}$	6	$10\frac{7}{8}$	2	$5\frac{1}{8}$	7	$11\frac{3}{8}$	2	$9\frac{1}{8}$	9	0	3	$1\frac{1}{8}$	10	$0\frac{1}{2}$
2	$1\frac{1}{4}$	6	$11\frac{1}{4}$	2	$5\frac{1}{4}$	7	$11\frac{3}{4}$	2	$9\frac{1}{4}$	9	$0\frac{3}{8}$	3	$1\frac{1}{4}$	10	$0\frac{7}{8}$
2	$1\frac{3}{8}$	6	$11\frac{5}{8}$	2	$5\frac{3}{8}$	8	$0\frac{1}{8}$	2	$9\frac{3}{8}$	9	$0\frac{3}{4}$	3	$1\frac{3}{8}$	10	$1\frac{3}{8}$
2	$1\frac{1}{2}$	7	0	2	$5\frac{1}{2}$	8	$0\frac{1}{2}$	2	$9\frac{1}{2}$	9	$1\frac{1}{8}$	3	$1\frac{1}{2}$	10	$1\frac{3}{4}$
2	$1\frac{5}{8}$	7	$0\frac{3}{8}$	2	$5\frac{5}{8}$	8	1	2	$9\frac{5}{8}$	9	$1\frac{1}{2}$	3	$1\frac{5}{8}$	10	$2\frac{1}{8}$
2	$1\frac{3}{4}$	7	$0\frac{3}{4}$	2	$5\frac{3}{4}$	8	$1\frac{3}{8}$	2	$9\frac{3}{4}$	9	$1\frac{7}{8}$	3	$1\frac{3}{4}$	10	$2\frac{1}{2}$
2	$1\frac{7}{8}$	7	$1\frac{1}{8}$	2	$5\frac{7}{8}$	8	$1\frac{3}{4}$	2	$9\frac{7}{8}$	9	$2\frac{3}{8}$	3	$1\frac{7}{8}$	10	$2\frac{7}{8}$

For Angle Iron measuring $\frac{5}{8}$ of an Inch thick, diagonally across the root,

FLANGE OUTSIDE.

INSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.		INSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.		INSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.		INSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.	
FT.	IN	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.
3	2	10	3¼	3	6	11	3⅞	3	10	12	4⅜	4	2	13	5
3	2⅛	10	3⅝	3	6⅛	11	4¼	3	10⅛	12	4¾	4	2⅛	13	5⅜
3	2¼	10	4	3	6¼	11	4⅝	3	10¼	12	5¼	4	2¼	13	5¾
3	2⅜	10	4½	3	6⅜	11	5	3	10⅜	12	5⅝	4	2⅜	13	6⅛
3	2½	10	4⅞	3	6½	11	5⅜	3	10½	12	6	4	2½	13	6½
3	2⅝	10	5¼	3	6⅝	11	5¾	3	10⅝	12	6⅜	4	2⅝	13	7
3	2¾	10	5⅝	3	6¾	11	6¼	3	10¾	12	6¾	4	2¾	13	7⅜
3	2⅞	10	6	3	6⅞	11	6⅝	3	10⅞	12	7⅛	4	2⅞	13	7¾
3	3	10	6⅜	3	7	11	7	3	11	12	7½	4	3	13	8⅛
3	3⅛	10	6⅞	3	7⅛	11	7⅜	3	11⅛	12	7⅞	4	3⅛	13	8½
3	3¼	10	7¼	3	7¼	11	7¾	3	11¼	12	8⅜	4	3¼	13	8⅞
3	3⅜	10	7⅝	3	7⅜	11	8⅛	3	11⅜	12	8¾	4	3⅜	13	9¼
3	3½	10	8	3	7½	11	8½	3	11½	12	9⅛	4	3½	13	9⅝
3	3⅝	10	8⅜	3	7⅝	11	8⅞	3	11⅝	12	9½	4	3⅝	13	10⅛
3	3¾	10	8¾	3	7¾	11	9⅜	3	11¾	12	9⅞	4	3¾	13	10½
3	3⅞	10	9⅛	3	7⅞	11	9¾	3	11⅞	12	10⅜	4	3⅞	13	10⅞
3	4	10	9½	3	8	11	10⅛	4	0	12	10¾	4	4	13	11¼
3	4⅛	10	9⅞	3	8⅛	11	10½	4	0⅛	12	11⅛	4	4⅛	13	11⅝
3	4¼	10	10⅜	3	8¼	11	10⅞	4	0¼	12	11½	4	4¼	14	0
3	4⅜	10	10¾	3	8⅜	11	11¼	4	0⅜	12	11⅞	4	4⅜	14	0⅜
3	4½	10	11⅛	3	8½	11	11⅝	4	0½	13	0¼	4	4½	14	0⅞
3	4⅝	10	11½	3	8⅝	12	0⅛	4	0⅝	13	0⅝	4	4⅝	14	1¼
3	4¾	10	11⅞	3	8¾	12	0½	4	0¾	13	1	4	4¾	14	1⅝
3	4⅞	11	0⅜	3	8⅞	12	0⅞	4	0⅞	13	1½	4	4⅞	14	2
3	5	11	0¾	3	9	12	1¼	4	1	13	1⅞	4	5	14	2⅜
3	5⅛	11	1⅛	3	9⅛	12	1⅝	4	1⅛	13	2¼	4	5⅛	14	2¾
3	5¼	11	1½	3	9¼	12	2	4	1¼	13	2⅝	4	5¼	14	3⅛
3	5⅜	11	1⅞	3	9⅜	12	2⅜	4	1⅜	13	3	4	5⅜	14	3½
3	5½	11	2¼	3	9½	12	2⅞	4	1½	13	3⅜	4	5½	14	4
3	5⅝	11	2⅝	3	9⅝	12	3¼	4	1⅝	13	3¾	4	5⅝	14	4⅜
3	5¾	11	3	3	9¾	12	3⅝	4	1¾	13	4¼	4	5¾	14	4¾
3	5⅞	11	3½	3	9⅞	12	4	4	1⅞	13	4⅝	4	5⅞	14	5⅛

For Angle Iron measuring $\frac{5}{8}$ of an Inch thick, diagonally across the root.

FLANGE OUTSIDE.

INSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.		INSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.		INSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.		INSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.	
FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.
4	6	14	5½	4	10	15	6⅛	5	2	16	6⅝	5	6	17	7¼
4	6⅛	14	5⅞	4	10⅛	15	6½	5	2⅛	16	7	5	6⅛	17	7⅝
4	6¼	14	6⅜	4	10¼	15	6⅞	5	2¼	16	7½	5	6¼	17	8
4	6⅜	14	6¾	4	10⅜	15	7¼	5	2⅜	16	7⅞	5	6⅜	17	8⅜
4	6½	14	7⅛	4	10½	15	7¾	5	2½	16	8¼	5	6½	17	8⅞
4	6⅝	14	7½	4	10⅝	15	8⅛	5	2⅝	16	8⅝	5	6⅝	17	9¼
4	6¾	14	7⅞	4	10¾	15	8½	5	2¾	16	9	5	6¾	17	9⅝
4	6⅞	14	8¼	4	10⅞	15	8⅞	5	2⅞	16	9⅜	5	6⅞	17	10
4	7	14	8¾	4	11	15	9¼	5	3	16	9⅞	5	7	17	10⅜
4	7⅛	14	9⅛	4	11⅛	15	9⅝	5	3⅛	16	10¼	5	7⅛	17	10¾
4	7¼	14	9½	4	11¼	15	10	5	3¼	16	10⅝	5	7¼	17	11⅛
4	7⅜	14	9⅞	4	11⅜	15	10⅜	5	3⅜	16	11	5	7⅜	17	11½
4	7½	14	10¼	4	11½	15	10⅞	5	3½	16	11⅜	5	7½	18	0
4	7⅝	14	10⅝	4	11⅝	15	11¼	5	3⅝	16	11¾	5	7⅝	18	0⅜
4	7¾	14	11	4	11¾	15	11⅝	5	3¾	17	0⅛	5	7¾	18	0¾
4	7⅞	14	11½	4	11⅞	16	0	5	3⅞	17	0⅝	5	7⅞	18	1⅛
4	8	14	11⅞	5	0	16	0⅜	5	4	17	1	5	8	18	1½
4	8⅛	15	0¼	5	0⅛	16	0¾	5	4⅛	17	1⅜	5	8⅛	18	1⅞
4	8¼	15	0⅝	5	0¼	16	1⅛	5	4¼	17	1¾	5	8¼	18	2⅜
4	8⅜	15	1	5	0⅜	16	1⅝	5	4⅜	17	2⅛	5	8⅜	18	2¾
4	8½	15	1⅜	5	0½	16	2	5	4½	17	2½	5	8½	18	3⅛
4	8⅝	15	1⅞	5	0⅝	16	2⅜	5	4⅝	17	2⅞	5	8⅝	18	3½
4	8¾	15	2¼	5	0¾	16	2¾	5	4¾	17	3⅜	5	8¾	18	3⅞
4	8⅞	15	2⅝	5	0⅞	16	3⅛	5	4⅞	17	3¾	5	8⅞	18	4¼
4	9	15	3	5	1	16	3½	5	5	17	4⅛	5	9	18	4⅝
4	9⅛	15	3⅜	5	1⅛	16	3⅞	5	5⅛	17	4½	5	9⅛	18	5
4	9¼	15	3¾	5	1¼	16	4⅜	5	5¼	17	4⅞	5	9¼	18	5½
4	9⅜	15	4⅛	5	1⅜	16	4¾	5	5⅜	17	5¼	5	9⅜	18	5⅞
4	9½	15	4½	5	1½	16	5⅛	5	5½	17	5⅝	5	9½	18	6¼
4	9⅝	15	4⅞	5	1⅝	16	5½	5	5⅝	17	6	5	9⅝	18	6⅝
4	9¾	15	5⅜	5	1¾	16	5⅞	5	5¾	17	6½	5	9¾	18	7
4	9⅞	15	5¾	5	1⅞	16	6¼	5	5⅞	17	6⅞	5	9⅞	18	7⅜

For Angle Iron measuring $\frac{3}{8}$ of an Inch thick, diagonally across the root.

FLANGE OUTSIDE.

Inside Diameter of Ring.		Length Required for Ring.		Inside Diameter of Ring.		Length Required for Ring.		Inside Diameter of Ring.		Length Required for Ring.		Inside Diameter of Ring.		Length Required for Ring.	
Ft.	In.	Ft.	In.	Ft.	In.	Ft.	In.	Ft.	In.	Ft.	In.	Ft.	In.	Ft.	In.
5	10	18	7 7/8	6	2	19	8 3/8	6	6	20	9	6	10	21	9 1/2
5	10 1/8	18	8 1/4	6	2 1/8	19	8 3/4	6	6 1/8	20	9 3/8	6	10 1/8	21	9 7/8
5	10 1/4	18	8 5/8	6	2 1/4	19	9 1/8	6	6 1/4	20	9 3/4	6	10 1/4	21	10 3/8
5	10 3/8	18	9	6	2 3/8	19	9 5/8	6	6 3/8	20	10 1/8	6	10 3/8	21	10 3/4
5	10 1/2	18	9 3/8	6	2 1/2	19	10	6	6 1/2	20	10 1/2	6	10 1/2	21	11 1/8
5	10 5/8	18	9 3/4	6	2 5/8	19	10 3/8	6	6 5/8	20	10 7/8	6	10 5/8	21	11 1/2
5	10 3/4	18	10 1/8	6	2 3/4	19	10 3/4	6	6 3/4	20	11 3/8	6	10 3/4	21	11 7/8
5	10 7/8	18	10 1/2	6	2 7/8	19	11 1/8	6	6 7/8	20	11 3/4	6	10 7/8	22	0 1/4
5	11	18	11	6	3	19	11 1/2	6	7	21	0 1/8	6	11	22	0 5/8
5	11 1/8	18	11 3/8	6	3 1/8	19	11 7/8	6	7 1/8	21	0 1/2	6	11 1/8	22	1
5	11 1/4	18	11 3/4	6	3 1/4	20	0 3/8	6	7 1/4	21	0 7/8	6	11 1/4	22	1 1/2
5	11 3/8	19	0 1/8	6	3 3/8	20	0 3/4	6	7 3/8	21	1 1/4	6	11 3/8	22	1 7/8
5	11 1/2	19	0 1/2	6	3 1/2	20	1 1/8	6	7 1/2	21	1 5/8	6	11 1/2	22	2 1/4
5	11 5/8	19	0 7/8	6	3 5/8	20	1 1/2	6	7 5/8	21	2	6	11 5/8	22	2 5/8
5	11 3/4	19	1 3/8	6	3 3/4	20	1 7/8	6	7 3/4	21	2 1/2	6	11 3/4	22	3
5	11 7/8	19	1 3/4	6	3 7/8	20	2 1/4	6	7 7/8	21	2 7/8	6	11 7/8	22	3 3/8
6	0	19	2 1/8	6	4	20	2 5/8	6	8	21	3 1/4	7	0	22	3 7/8
6	0 1/8	19	2 1/2	6	4 1/8	20	3	6	8 1/8	21	3 5/8	7	0 1/8	22	4 1/4
6	0 1/4	19	2 7/8	6	4 1/4	20	3 1/2	6	8 1/4	21	4	7	0 1/4	22	4 5/8
6	0 3/8	19	3 1/4	6	4 3/8	20	3 7/8	6	8 3/8	21	4 3/8	7	0 3/8	22	5
6	0 1/2	19	3 5/8	6	4 1/2	20	4 1/4	6	8 1/2	21	4 3/4	7	0 1/2	22	5 3/8
6	0 5/8	19	4	6	4 5/8	20	4 5/8	6	8 5/8	21	5 1/8	7	0 5/8	22	5 3/4
6	0 3/4	19	4 1/2	6	4 3/4	20	5	6	8 3/4	21	5 1/2	7	0 3/4	22	6 1/8
6	0 7/8	19	4 7/8	6	4 7/8	20	5 3/8	6	8 7/8	21	6	7	0 7/8	22	6 1/2
6	1	19	5 1/4	6	5	20	5 7/8	6	9	21	6 3/8	7	1	22	7
6	1 1/8	19	5 5/8	6	5 1/8	20	6 1/4	6	9 1/8	21	6 7/8	7	1 1/8	22	7 3/8
6	1 1/4	19	6	6	5 1/4	20	6 5/8	6	9 1/4	21	7 1/8	7	1 1/4	22	7 3/4
6	1 3/8	19	6 3/8	6	5 3/8	20	7	6	9 3/8	21	7 5/8	7	1 3/8	22	8 1/8
6	1 1/2	19	6 7/8	6	5 1/2	20	7 3/8	6	9 1/2	21	8	7	1 1/2	22	8 1/2
6	1 5/8	19	7 1/4	6	5 5/8	20	7 3/4	6	9 5/8	21	8 3/8	7	1 5/8	22	8 7/8
6	1 3/4	19	7 5/8	6	5 3/4	20	8 1/8	6	9 3/4	21	8 3/4	7	1 3/4	22	9 1/4
6	1 7/8	19	8	6	5 7/8	20	8 1/2	6	9 7/8	21	9 1/8	7	1 7/8	22	9 3/4

For Angle Iron measuring $\frac{5}{8}$ of an Inch thick, diagonally across the root.

FLANGE OUTSIDE.

INSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.		INSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.		INSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.		INSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.	
FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.
7	2	22	10 1/8	7	6	23	10 5/8	7	10	24	11 1/4	8	2	25	11 3/4
7	2 1/8	22	10 1/2	7	6 1/8	23	11	7	10 1/8	24	11 5/8	8	2 1/8	26	0 1/8
7	2 1/4	22	10 7/8	7	6 1/4	23	11 1/2	7	10 1/4	25	0	8	2 1/4	26	0 5/8
7	2 3/8	22	11 1/4	7	6 3/8	23	11 7/8	7	10 3/8	25	0 3/8	8	2 3/8	26	1
7	2 1/2	22	11 5/8	7	6 1/2	24	0 1/4	7	10 1/2	25	0 3/4	8	2 1/2	26	1 3/8
7	2 5/8	23	0	7	6 5/8	24	0 5/8	7	10 5/8	25	1 1/4	8	2 5/8	26	1 3/4
7	2 3/4	23	0 1/2	7	6 3/4	24	1	7	10 3/4	25	1 5/8	8	2 3/4	26	2 1/8
7	2 7/8	23	0 7/8	7	6 7/8	24	1 3/8	7	10 7/8	25	2	8	2 7/8	26	2 1/2
7	3	23	1 1/4	7	7	24	1 3/4	7	11	25	2 3/8	8	3	26	2 7/8
7	3 1/8	23	1 5/8	7	7 1/8	24	2 1/4	7	11 1/8	25	2 3/4	8	3 1/8	26	3 3/8
7	3 1/4	23	2	7	7 1/4	24	2 5/8	7	11 1/4	25	3 1/8	8	3 1/4	26	3 3/4
7	3 3/8	23	2 3/8	7	7 3/8	24	3	7	11 3/8	25	3 1/2	8	3 3/8	26	4 1/8
7	3 1/2	23	2 3/4	7	7 1/2	24	3 3/8	7	11 1/2	25	3 7/8	8	3 1/2	26	4 1/2
7	3 5/8	23	3 1/4	7	7 5/8	24	3 3/4	7	11 5/8	25	4 3/8	8	3 5/8	26	4 7/8
7	3 3/4	23	3 5/8	7	7 3/4	24	4 1/8	7	11 3/4	25	4 3/4	8	3 3/4	26	5 1/4
7	3 7/8	23	4	7	7 7/8	24	4 1/2	7	11 7/8	25	5	8	3 7/8	26	5 5/8
7	4	23	4 3/8	7	8	24	4 7/8	8	0	25	5 1/2	8	4	26	6
7	4 1/8	23	4 3/4	7	8 1/8	24	5 3/8	8	0 1/8	25	5 7/8	8	4 1/8	26	6 1/2
7	4 1/4	23	5 1/8	7	8 1/4	24	5 3/4	8	0 1/4	25	6 1/4	8	4 1/4	26	6 7/8
7	4 3/8	23	5 1/2	7	8 3/8	24	6 1/8	8	0 3/8	25	6 5/8	8	4 3/8	26	7 1/4
7	4 1/2	23	6	7	8 1/2	24	6 1/2	8	0 1/2	25	7	8	4 1/2	26	7 5/8
7	4 5/8	23	6 3/8	7	8 5/8	24	6 7/8	8	0 5/8	25	7 1/2	8	4 5/8	26	8
7	4 3/4	23	6 3/4	7	8 3/4	24	7 1/4	8	0 3/4	25	7 7/8	8	4 3/4	26	8 3/8
7	4 7/8	23	7 1/8	7	8 7/8	24	7 5/8	8	0 7/8	25	8 1/4	8	4 7/8	26	8 7/8
7	5	23	7 1/2	7	9	24	8	8	1	25	8 5/8	8	5	26	9 1/4
7	5 1/8	23	7 7/8	7	9 1/8	24	8 1/2	8	1 1/8	25	9	8	5 1/8	26	9 5/8
7	5 1/4	23	8 1/4	7	9 1/4	24	8 7/8	8	1 1/4	25	9 1/2	8	5 1/4	26	10
7	5 3/8	23	8 3/4	7	9 3/8	24	9 1/4	8	1 3/8	25	9 7/8	8	5 3/8	26	10 3/8
7	5 1/2	23	9 1/8	7	9 1/2	24	9 5/8	8	1 1/2	25	10 1/4	8	5 1/2	26	10 3/4
7	5 5/8	23	9 1/2	7	9 5/8	24	10	8	1 5/8	25	10 5/8	8	5 5/8	26	11 1/8
7	5 3/4	23	9 7/8	7	9 3/4	24	10 1/2	8	1 3/4	25	11	8	5 3/4	26	11 1/2
7	5 7/8	23	10 1/4	7	9 7/8	24	10 7/8	8	1 7/8	25	11 3/8	8	5 7/8	27	0

TABLE V.,

For Angle Iron measuring $\frac{3}{4}$ of an Inch thick, diagonally across the root.

FLANGE OUTSIDE.

INSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.		INSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.		INSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.		INSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.	
FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.
0	9	2	9	1	1	3	9½	1	5	4	10⅛	1	9	5	10⅝
0	9⅛	2	9⅜	1	1⅛	3	9⅞	1	5⅛	4	10½	1	9⅛	5	11
0	9¼	2	9¾	1	1¼	3	10⅜	1	5¼	4	10⅞	1	9¼	5	11½
0	9⅜	2	10⅛	1	1⅜	3	10¾	1	5⅜	4	11¼	1	9⅜	5	11⅞
0	9½	2	10½	1	1½	3	11⅛	1	5½	4	11⅝	1	9½	6	0¼
0	9⅝	2	10⅞	1	1⅝	3	11½	1	5⅝	5	0	1	9⅝	6	0⅝
0	9¾	2	11⅜	1	1¾	3	11⅞	1	5¾	5	0⅜	1	9¾	6	1
0	9⅞	2	11¾	1	1⅞	4	0¼	1	5⅞	5	0⅞	1	9⅞	6	1⅜
0	10	3	0⅛	1	2	4	0⅝	1	6	5	1¼	1	10	6	1¾
0	10⅛	3	0½	1	2⅛	4	1	1	6⅛	5	1⅝	1	10⅛	6	2¼
0	10¼	3	0⅞	1	2¼	4	1⅜	1	6¼	5	2	1	10¼	6	2⅝
0	10⅜	3	1¼	1	2⅜	4	1⅞	1	6⅜	5	2⅜	1	10⅜	6	3
0	10½	3	1⅝	1	2½	4	2¼	1	6½	5	2¾	1	10½	6	3⅜
0	10⅝	3	2	1	2⅝	4	2⅝	1	6⅝	5	3⅛	1	10⅝	6	3¾
0	10¾	3	2½	1	2¾	4	3	1	6¾	5	3⅝	1	10¾	6	4⅛
0	10⅞	3	2⅞	1	2⅞	4	3⅜	1	6⅞	5	4	1	10⅞	6	4½
0	11	3	3¼	1	3	4	3¾	1	7	5	4⅜	1	11	6	4⅞
0	11⅛	3	3⅜	1	3⅛	4	4⅛	1	7⅛	5	4¾	1	11⅛	6	5⅜
0	11¼	3	4	1	3¼	4	4½	1	7¼	5	5⅛	1	11¼	6	5¾
0	11⅜	3	4⅜	1	3⅜	4	5	1	7⅜	5	5½	1	11⅜	6	6⅛
0	11½	3	4⅞	1	3½	4	5⅜	1	7½	5	5⅞	1	11½	6	6½
0	11⅝	3	5¼	1	3⅝	4	5¾	1	7⅝	5	6⅜	1	11⅝	6	6⅞
0	11¾	3	5⅝	1	3¾	4	6⅛	1	7¾	5	6¾	1	11¾	6	7¼
0	11⅞	3	6	1	3⅞	4	6½	1	7⅞	5	7⅛	1	11⅞	6	7⅝
1	0	3	6⅜	1	4	4	7	1	8	5	7½	2	0	6	8⅛
1	0⅛	3	6¾	1	4⅛	4	7⅜	1	8⅛	5	8	2	0⅛	6	8½
1	0¼	3	7⅛	1	4¼	4	7¾	1	8¼	5	8⅜	2	0¼	6	8⅞
1	0⅜	3	7⅝	1	4⅜	4	8⅛	1	8⅜	5	8¾	2	0⅜	6	9¼
1	0½	3	8	1	4½	4	8½	1	8½	5	9⅛	2	0½	6	9⅝
1	0⅝	3	8⅜	1	4⅝	4	8⅞	1	8⅝	5	9½	2	0⅝	6	10
1	0¾	3	8¾	1	4¾	4	9¼	1	8¾	5	9⅞	2	0¾	6	10½
1	0⅞	3	9⅛	1	4⅞	4	9⅝	1	8⅞	5	10¼	2	0⅞	6	10⅞

For Angle Iron measuring $\frac{3}{4}$ of an Inch thick, diagonally across the root.

FLANGE OUTSIDE.

INSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.		INSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.		INSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.		INSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.	
FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.
2	1	6	11¼	2	5	7	11¾	2	9	9	0⅜	3	1	10	0⅞
2	1⅛	6	11⅝	2	5⅛	8	0⅛	2	9⅛	9	0¾	3	1⅛	10	1⅜
2	1¼	7	0	2	5¼	8	0½	2	9¼	9	1⅛	3	1¼	10	1¾
2	1⅜	7	0⅜	2	5⅜	8	1	2	9⅜	9	1½	3	1⅜	10	2⅛
2	1½	7	0¾	2	5½	8	1⅜	2	9½	9	1⅞	3	1½	10	2½
2	1⅝	7	1⅛	2	5⅝	8	1¾	2	9⅝	9	2⅜	3	1⅝	10	2⅞
2	1¾	7	1½	2	5¾	8	2⅛	2	9¾	9	2¾	3	1¾	10	3¼
2	1⅞	7	2	2	5⅞	8	2½	2	9⅞	9	3⅛	3	1⅞	10	3⅝
2	2	7	2⅜	2	6	8	2⅞	2	10	9	3½	3	2	10	4
2	2⅛	7	2¾	2	6⅛	8	3⅜	2	10⅛	9	3⅞	3	2⅛	10	4½
2	2¼	7	3⅛	2	6¼	8	3¾	2	10¼	9	4¼	3	2¼	10	4⅞
2	2⅜	7	3½	2	6⅜	8	4⅛	2	10⅜	9	4⅝	3	2⅜	10	5¼
2	2½	7	3⅞	2	6½	8	4½	2	10½	9	5	3	2½	10	5⅝
2	2⅝	7	4⅜	2	6⅝	8	4⅞	2	10⅝	9	5½	3	2⅝	10	6
2	2¾	7	4¾	2	6¾	8	5¼	2	10¾	9	5⅞	3	2¾	10	6⅜
2	2⅞	7	5⅛	2	6⅞	8	5⅝	2	10⅞	9	6¼	3	2⅞	10	6⅞
2	3	7	5½	2	7	8	6	2	11	9	6⅝	3	3	10	7¼
2	3⅛	7	5⅞	2	7⅛	8	6½	2	11⅛	9	7	3	3⅛	10	7⅝
2	3¼	7	6¼	2	7¼	8	6⅞	2	11¼	9	7⅜	3	3¼	10	8
2	3⅜	7	6⅝	2	7⅜	8	7¼	2	11⅜	9	7⅞	3	3⅜	10	8⅜
2	3½	7	7	2	7½	8	7⅝	2	11½	9	8¼	3	3½	10	8¾
2	3⅝	7	7½	2	7⅝	8	8	2	11⅝	9	8⅝	3	3⅝	10	9⅛
2	3¾	7	7⅞	2	7¾	8	8⅜	2	11¾	9	9	3	3¾	10	9½
2	3⅞	7	8¼	2	7⅞	8	8⅞	2	11⅞	9	9⅜	3	3⅞	10	9⅞
2	4	7	8⅝	2	8	8	9¼	3	0	9	9¾	3	4	10	10⅜
2	4⅛	7	9	2	8⅛	8	9⅝	3	0⅛	9	10¼	3	4⅛	10	10¾
2	4¼	7	9⅜	2	8¼	8	10	3	0¼	9	10½	3	4¼	10	11⅛
2	4⅜	7	9¾	2	8⅜	8	10⅜	3	0⅜	9	10⅞	3	4⅜	10	11½
2	4½	7	10¼	2	8½	8	10¾	3	0½	9	11⅜	3	4½	10	11⅞
2	4⅝	7	10⅝	2	8⅝	8	11⅛	3	0⅝	9	11¾	3	4⅝	11	0⅜
2	4¾	7	11	2	8¾	8	11½	3	0¾	10	0⅛	3	4¾	11	0¾
2	4⅞	7	11⅜	2	8⅞	9	0	3	0⅞	10	0½	3	4⅞	11	1⅛

For Angle Iron measuring $\frac{3}{4}$ of an Inch thick, diagonally across the root.

FLANGE OUTSIDE.

INSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.		INSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.		INSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.		INSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.	
FT.	IN.	FT.	IN.	FT.	IN	FT.	IN.	FT.	IN.	FT.	IN	FT.	IN.	FT.	IN.
3	5	11	1½	3	9	12	2	4	1	13	2⅝	4	5	14	3⅛
3	5⅛	11	1⅞	3	9⅛	12	2⅜	4	1⅛	13	3	4	5⅛	14	3½
3	5¼	11	2¼	3	9¼	12	2⅞	4	1¼	13	3⅜	4	5¼	14	4
3	5⅜	11	2⅝	3	9⅜	12	3¼	4	1⅜	13	3¾	4	5⅜	14	4⅜
3	5½	11	3	3	9½	12	3⅝	4	1½	13	4¼	4	5½	14	4¾
3	5⅝	11	3½	3	9⅝	12	4	4	1⅝	13	4⅝	4	5⅝	14	5⅛
3	5¾	11	3⅞	3	9¾	12	4⅜	4	1¾	13	5	4	5¾	14	5½
3	5⅞	11	4¼	3	9⅞	12	4¾	4	1⅞	13	5⅜	4	5⅞	14	5⅞
3	6	11	4⅝	3	10	12	5¼	4	2	13	5¾	4	6	14	6⅜
3	6⅛	11	5	3	10⅛	12	5⅝	4	2⅛	13	6⅛	4	6⅛	14	6¾
3	6¼	11	5⅜	3	10¼	12	6	4	2¼	13	6½	4	6¼	14	7⅛
3	6⅜	11	5¾	3	10⅜	12	6⅜	4	2⅜	13	7	4	6⅜	14	7½
3	6½	11	6¼	3	10½	12	6¾	4	2½	13	7⅜	4	6½	14	7⅞
3	6⅝	11	6⅞	3	10⅝	12	7⅛	4	2⅝	13	7¾	4	6⅝	14	8¼
3	6¾	11	7	3	10¾	12	7½	4	2¾	13	8⅛	4	6¾	14	8¾
3	6⅞	11	7⅜	3	10⅞	12	7⅞	4	2⅞	13	8½	4	6⅞	14	9⅛
3	7	11	7¾	3	11	12	8⅜	4	3	13	8⅞	4	7	14	9½
3	7⅛	11	8⅛	3	11⅛	12	8¾	4	3⅛	13	9¼	4	7⅛	14	9⅞
3	7¼	11	8½	3	11¼	12	9⅛	4	3¼	13	9⅝	4	7¼	14	10¼
3	7⅜	11	8⅞	3	11⅜	12	9½	4	3⅜	13	10⅛	4	7⅜	14	10⅝
3	7½	11	9⅜	3	11½	12	9⅞	4	3½	13	10½	4	7½	14	11
3	7⅝	11	9¾	3	11⅝	12	10⅜	4	3⅝	13	10⅞	4	7⅝	14	11½
3	7¾	11	10⅛	3	11¾	12	10¾	4	3¾	13	11¼	4	7¾	14	11⅞
3	7⅞	11	10½	3	11⅞	12	11⅛	4	3⅞	13	11⅝	4	7⅞	15	0¼
3	8	11	10⅞	4	0	12	11½	4	4	14	0	4	8	15	0⅝
3	8⅛	11	11¼	4	0⅛	12	11⅞	4	4⅛	14	0⅜	4	8⅛	15	1
3	8¼	11	11⅝	4	0¼	13	0¼	4	4¼	14	0⅞	4	8¼	15	1⅜
3	8⅜	12	0⅛	4	0⅜	13	0⅝	4	4⅜	14	1¼	4	8⅜	15	1⅞
3	8½	12	0½	4	0½	13	1	4	4½	14	1⅝	4	8½	15	2¼
3	8⅝	12	0⅞	4	0⅝	13	1½	4	4⅝	14	2	4	8⅝	15	2⅝
3	8¾	12	1¼	4	0¾	13	1⅞	4	4¾	14	2⅜	4	8¾	15	3
3	8⅞	12	1⅝	4	0⅞	13	2¼	4	4⅞	14	2¾	4	8⅞	15	3⅜

For ANGLE IRON measuring ¾ of an Inch thick, diagonally across the root.

FLANGE OUTSIDE.

INSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.		INSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.		INSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.		INSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.	
FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.
4	9	15	3¾	5	1	16	4⅜	5	5	17	4⅞	5	9	18	5½
4	9⅛	15	4⅛	5	1⅛	16	4¾	5	5⅛	17	5¼	5	9⅛	18	5⅞
4	9¼	15	4½	5	1¼	16	5⅛	5	5¼	17	5⅝	5	9¼	18	6¼
4	9⅜	15	4⅞	5	1⅜	16	5½	5	5⅜	17	6	5	9⅜	18	6⅝
4	9½	15	5⅜	5	1½	16	5⅞	5	5½	17	6½	5	9½	18	7
4	9⅝	15	5¾	5	1⅝	16	6¼	5	5⅝	17	6⅞	5	9⅝	18	7⅜
4	9¾	15	6⅛	5	1¾	16	6⅝	5	5¾	17	7¼	5	9¾	18	7⅞
4	9⅞	15	6½	5	1⅞	16	7	5	5⅞	17	7⅝	5	9⅞	18	8¼
4	10	15	6⅞	5	2	16	7½	5	6	17	8	5	10	18	8⅝
4	10⅛	15	7¼	5	2⅛	16	7⅞	5	6⅛	17	8⅜	5	10⅛	18	9
4	10¼	15	7¾	5	2¼	16	8¼	5	6¼	17	8⅞	5	10¼	18	9⅜
4	10⅜	15	8⅛	5	2⅜	16	8⅝	5	6⅜	17	9¼	5	10⅜	18	9¾
4	10½	15	8½	5	2½	16	9	5	6½	17	9⅝	5	10½	18	10⅛
4	10⅝	15	8⅞	5	2⅝	16	9⅜	5	6⅝	17	10	5	10⅝	18	10½
4	10¾	15	9¼	5	2¾	16	9⅞	5	6¾	17	10⅜	5	10¾	18	11
4	10⅞	15	9⅝	5	2⅞	16	10¼	5	6⅞	17	10¾	5	10⅞	18	11⅜
4	11	15	10	5	3	16	10⅝	5	7	17	11⅛	5	11	18	11¾
4	11⅛	15	10⅜	5	3⅛	16	11	5	7⅛	17	11½	5	11⅛	19	0⅛
4	11¼	15	10⅞	5	3¼	16	11⅜	5	7¼	18	0	5	11¼	19	0½
4	11⅜	15	11¼	5	3⅜	16	11¾	5	7⅜	18	0⅜	5	11⅜	19	0⅞
4	11½	15	11⅝	5	3½	17	0⅛	5	7½	18	0¾	5	11½	19	1⅜
4	11⅝	16	0	5	3⅝	17	0⅝	5	7⅝	18	1⅛	5	11⅝	19	1¾
4	11¾	16	0⅜	5	3¾	17	1	5	7¾	18	1½	5	11¾	19	2⅛
4	11⅞	16	0¾	5	3⅞	17	1⅜	5	7⅞	18	1⅞	5	11⅞	19	2½
5	0	16	1⅛	5	4	17	1¾	5	8	18	2⅜	6	0	19	2⅞
5	0⅛	16	1⅝	5	4⅛	17	2⅛	5	8⅛	18	2¾	6	0⅛	19	3¼
5	0¼	16	2	5	4¼	17	2½	5	8¼	18	3⅛	6	0¼	19	3⅝
5	0⅜	16	2⅜	5	4⅜	17	2⅞	5	8⅜	18	3½	6	0⅜	19	4
5	0½	16	2¾	5	4½	17	3⅜	5	8½	18	3⅞	6	0½	19	4½
5	0⅝	16	3⅛	5	4⅝	17	3¾	5	8⅝	18	4¼	6	0⅝	19	4⅞
5	0¾	16	3½	5	4¾	17	4⅛	5	8¾	18	4⅝	6	0¾	19	5¼
5	0⅞	16	3⅞	5	4⅞	17	4½	5	8⅞	18	5	6	0⅞	19	5⅝

For Angle Iron measuring $\frac{3}{4}$ of an Inch thick, diagonally across the root.

FLANGE OUTSIDE.

INSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.		INSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.		INSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.		INSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.	
FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.
6	1	19	6	6	5	20	6 5/8	6	9	21	7 1/8	7	1	22	7 3/4
6	1 1/8	19	6 3/8	6	5 1/8	20	7	6	9 1/8	21	7 5/8	7	1 1/8	22	8 1/8
6	1 1/4	19	6 7/8	6	5 1/4	20	7 3/8	6	9 1/4	21	8	7	1 1/4	22	8 1/2
6	1 3/8	19	7 1/4	6	5 3/8	20	7 3/4	6	9 3/8	21	8 3/8	7	1 3/8	22	8 7/8
6	1 1/2	19	7 5/8	6	5 1/2	20	8 1/8	6	9 1/2	21	8 3/4	7	1 1/2	22	9 1/4
6	1 5/8	19	8	6	5 5/8	20	8 1/2	6	9 5/8	21	9 1/8	7	1 5/8	22	9 3/4
6	1 3/4	19	8 3/8	6	5 3/4	20	9	6	9 3/4	21	9 1/2	7	1 3/4	22	10 1/8
6	1 7/8	19	8 3/4	6	5 7/8	20	9 3/8	6	9 7/8	21	9 7/8	7	1 7/8	22	10 1/2
6	2	19	9 1/8	6	6	20	9 3/4	6	10	21	10 3/8	7	2	22	10 7/8
6	2 1/8	19	9 5/8	6	6 1/8	20	10 1/8	6	10 1/8	21	10 3/4	7	2 1/8	22	11 1/4
6	2 1/4	19	10	6	6 1/4	20	10 1/2	6	10 1/4	21	11 1/8	7	2 1/4	22	11 5/8
6	2 3/8	19	10 3/8	6	6 3/8	20	10 7/8	6	10 3/8	21	11 1/2	7	2 3/8	23	0
6	2 1/2	19	10 3/4	6	6 1/2	20	11 3/8	6	10 1/2	21	11 7/8	7	2 1/2	23	0 1/2
6	2 5/8	19	11 1/8	6	6 5/8	20	11 3/4	6	10 5/8	22	0 1/4	7	2 5/8	23	0 7/8
6	2 3/4	19	11 1/2	6	6 3/4	21	0 1/8	6	10 3/4	22	0 5/8	7	2 3/4	23	1 1/4
6	2 7/8	19	11 7/8	6	6 7/8	21	0 1/2	6	10 7/8	22	1	7	2 7/8	23	1 5/8
6	3	20	0 3/8	6	7	21	0 7/8	6	11	22	1 1/2	7	3	23	2
6	3 1/8	20	0 3/4	6	7 1/8	21	1 1/4	6	11 1/8	22	1 7/8	7	3 1/8	23	2 3/8
6	3 1/4	20	1 1/8	6	7 1/4	21	1 5/8	6	11 1/4	22	2 1/4	7	3 1/4	23	2 3/4
6	3 3/8	20	1 1/2	6	7 3/8	21	2	6	11 3/8	22	2 5/8	7	3 3/8	23	3 1/4
6	3 1/2	20	1 7/8	6	7 1/2	21	2 1/2	6	11 1/2	22	3	7	3 1/2	23	3 5/8
6	3 5/8	20	2 1/4	6	7 5/8	21	2 7/8	6	11 5/8	22	3 3/8	7	3 5/8	23	4
6	3 3/4	20	2 5/8	6	7 3/4	21	3 1/4	6	11 3/4	22	3 7/8	7	3 3/4	23	4 3/8
6	3 7/8	20	3	6	7 7/8	21	3 5/8	6	11 7/8	22	4 1/4	7	3 7/8	23	4 3/4
6	4	20	3 1/2	6	8	21	4	7	0	22	4 5/8	7	4	23	5 1/8
6	4 1/8	20	3 7/8	6	8 1/8	21	4 3/8	7	0 1/8	22	5	7	4 1/8	23	5 1/2
6	4 1/4	20	4 1/4	6	8 1/4	21	4 3/4	7	0 1/4	22	5 3/8	7	4 1/4	23	6
6	4 3/8	20	4 5/8	6	8 3/8	21	5 1/8	7	0 3/8	22	5 3/4	7	4 3/8	23	6 3/8
6	4 1/2	20	5	6	8 1/2	21	5 1/2	7	0 1/2	22	6 1/8	7	4 1/2	23	6 3/4
6	4 5/8	20	5 3/8	6	8 5/8	21	6	7	0 5/8	22	6 1/2	7	4 5/8	23	7 1/8
6	4 3/4	20	5 7/8	6	8 3/4	21	6 3/8	7	0 3/4	22	7	7	4 3/4	23	7 1/2
6	4 7/8	20	6 1/4	6	8 7/8	21	6 3/4	7	0 7/8	22	7 3/8	7	4 7/8	23	7 7/8

For ANGLE IRON measuring ¾ of an Inch thick, diagonally across the root.

FLANGE OUTSIDE.

INSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.		INSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.		INSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.		INSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.	
FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.
7	5	23	8¼	7	9	24	8⅞	8	1	25	9½	8	5	26	10
7	5⅛	23	8¾	7	9⅛	24	9¼	8	1⅛	25	9⅞	8	5⅛	26	10⅜
7	5¼	23	9⅛	7	9¼	24	9⅝	8	1¼	25	10¼	8	5¼	26	10¾
7	5⅜	23	9½	7	9⅜	24	10	8	1⅜	25	10⅝	8	5⅜	26	11⅛
7	5½	23	9⅞	7	9½	24	10½	8	1½	25	11	8	5½	26	11½
7	5⅝	23	10¼	7	9⅝	24	10⅞	8	1⅝	25	11⅜	8	5⅝	27	0
7	5¾	23	10⅝	7	9¾	24	11¼	8	1¾	25	11¾	8	5¾	27	0⅜
7	5⅞	23	11	7	9⅞	24	11⅝	8	1⅞	26	0⅛	8	5⅞	27	0¾
7	6	23	11½	7	10	25	0	8	2	26	0⅝	8	6	27	1⅛
7	6⅛	23	11⅞	7	10⅛	25	0⅜	8	2⅛	26	1	8	6⅛	27	1½
7	6¼	24	0¼	7	10¼	25	0¾	8	2¼	26	1⅜	8	6¼	27	1⅞
7	6⅜	24	0⅝	7	10⅜	25	1¼	8	2⅜	26	1¾	8	6⅜	27	2⅜
7	6½	24	1	7	10½	25	1⅝	8	2½	26	2⅛	8	6½	27	2¾
7	6⅝	24	1⅜	7	10⅝	25	2	8	2⅝	26	2½	8	6⅝	27	3⅛
7	6¾	24	1¾	7	10¾	25	2⅜	8	2¾	26	2⅞	8	6¾	27	3½
7	6⅞	24	2¼	7	10⅞	25	2¾	8	2⅞	26	3⅜	8	6⅞	27	3⅞
7	7	24	2⅝	7	11	25	3⅛	8	3	26	3¾	8	7	27	4¼
7	7⅛	24	3	7	11⅛	25	3½	8	3⅛	26	4⅛	8	7⅛	27	4⅝
7	7¼	24	3⅜	7	11¼	25	3⅞	8	3¼	26	4½	8	7¼	27	5
7	7⅜	24	3¾	7	11⅜	25	4⅜	8	3⅜	26	4⅞	8	7⅜	27	5½
7	7½	24	4⅛	7	11½	25	4¾	8	3½	26	5¼	8	7½	27	5⅞
7	7⅝	24	4½	7	11⅝	25	5⅛	8	3⅝	26	5⅝	8	7⅝	27	6¼
7	7¾	24	4⅞	7	11¾	25	5½	8	3¾	26	6	8	7¾	27	6⅝
7	7⅞	24	5⅜	7	11⅞	25	5⅞	8	3⅞	26	6½	8	7⅞	27	7
7	8	24	5¾	8	0	25	6¼	8	4	26	6⅞	8	8	27	7⅜
7	8⅛	24	6⅛	8	0⅛	25	6⅝	8	4⅛	26	7¼	8	8⅛	27	7⅞
7	8¼	24	6½	8	0¼	25	7	8	4¼	26	7⅝	8	8¼	27	8¼
7	8⅜	24	6⅞	8	0⅜	25	7½	8	4⅜	26	8	8	8⅜	27	8⅝
7	8½	24	7¼	8	0½	25	7⅞	8	4½	26	8⅜	8	8½	27	9
7	8⅝	24	7⅝	8	0⅝	25	8¼	8	4⅝	26	8⅞	8	8⅝	27	9⅜
7	8¾	24	8	8	0¾	25	8⅝	8	4¾	26	9¼	8	8¾	27	9¾
7	8⅞	24	8½	8	0⅞	25	9	8	4⅞	26	9⅝	8	8⅞	27	10⅛

TABLE VI.,

For Angle Iron measuring $\frac{7}{8}$ of an Inch thick, diagonally across the root.

FLANGE OUTSIDE.

INSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.		INSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.		INSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.		INSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.	
FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN	FT.	IN	FT.	IN.	FT.	IN.	FT.	IN.
0	9	2	9¾	1	1	3	10⅜	1	5	4	10⅞	1	9	5	11½
0	9⅛	2	10⅛	1	1⅛	3	10¾	1	5⅛	4	11¼	1	9⅛	5	11⅞
0	9¼	2	10½	1	1¼	3	11⅛	1	5¼	4	11⅝	1	9¼	6	0¼
0	9⅜	2	10⅞	1	1⅜	3	11½	1	5⅜	5	0	1	9⅜	6	0⅝
0	9½	2	11⅜	1	1½	3	11⅞	1	5½	5	0⅜	1	9½	6	1
0	9⅝	2	11¾	1	1⅝	4	0¼	1	5⅝	5	0⅞	1	9⅝	6	1⅜
0	9¾	3	0⅛	1	1¾	4	0⅝	1	5¾	5	1¼	1	9¾	6	1¾
0	9⅞	3	0½	1	1⅞	4	1	1	5⅞	5	1⅝	1	9⅞	6	2¼
0	10	3	0⅞	1	2	4	1⅜	1	6	5	2	1	10	6	2⅝
0	10⅛	3	1¼	1	2⅛	4	1⅞	1	6⅛	5	2⅜	1	10⅛	6	3
0	10¼	3	1⅝	1	2¼	4	2¼	1	6¼	5	2¾	1	10¼	6	3⅜
0	10⅜	3	2	1	2⅜	4	2⅝	1	6⅜	5	3⅛	1	10⅜	6	3¾
0	10½	3	2½	1	2½	4	3	1	6½	5	3⅝	1	10½	6	4⅛
0	10⅝	3	2⅞	1	2⅝	4	3⅜	1	6⅝	5	4	1	10⅝	6	4½
0	10¾	3	3¼	1	2¾	4	3¾	1	6¾	5	4⅜	1	10¾	6	4⅞
0	10⅞	3	3⅝	1	2⅞	4	4⅛	1	6⅞	5	4¾	1	10⅞	6	5⅜
0	11	3	4	1	3	4	4½	1	7	5	5⅛	1	11	6	5¾
0	11⅛	3	4⅜	1	3⅛	4	5	1	7⅛	5	5½	1	11⅛	6	6⅛
0	11¼	3	4⅞	1	3¼	4	5⅜	1	7¼	5	5⅞	1	11¼	6	6½
0	11⅜	3	5¼	1	3⅜	4	5¾	1	7⅜	5	6⅜	1	11⅜	6	6⅞
0	11½	3	5⅝	1	3½	4	6⅛	1	7½	5	6¾	1	11½	6	7¼
0	11⅝	3	6	1	3⅝	4	6½	1	7⅝	5	7⅛	1	11⅝	6	7⅝
0	11¾	3	6⅜	1	3¾	4	7	1	7¾	5	7½	1	11¾	6	8⅛
0	11⅞	3	6¾	1	3⅞	4	7⅜	1	7⅞	5	8	1	11⅞	6	8½
1	0	3	7⅛	1	4	4	7¾	1	8	5	8⅜	2	0	6	8⅞
1	0⅛	3	7⅞	1	4⅛	4	8⅛	1	8⅛	5	8¾	2	0⅛	6	9¼
1	0¼	3	8	1	4¼	4	8½	1	8¼	5	9⅛	2	0¼	6	9⅝
1	0⅜	3	8⅜	1	4⅜	4	8⅞	1	8⅜	5	9½	2	0⅜	6	10
1	0½	3	8¾	1	4½	4	9¼	1	8½	5	9⅞	2	0½	6	10½
1	0⅝	3	9⅛	1	4⅝	4	9⅝	1	8⅝	5	10¼	2	0⅝	6	10⅞
1	0¾	3	9½	1	4¾	4	10¼	1	8¾	5	10⅝	2	0¾	6	11¼
1	0⅞	3	9⅞	1	4⅞	4	10½	1	8⅞	5	11	2	0⅞	6	11⅝

For Angle Iron measuring $\frac{7}{8}$ of an Inch thick, diagonally across the root.

FLANGE OUTSIDE.

INSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.		INSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.		INSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.		INSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.	
FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.
2	1	7	0	2	5	8	$0\frac{1}{2}$	2	9	9	$1\frac{1}{8}$	3	1	10	$1\frac{3}{4}$
2	$1\frac{1}{8}$	7	$0\frac{3}{8}$	2	$5\frac{1}{8}$	8	1	2	$9\frac{1}{8}$	9	$1\frac{1}{2}$	3	$1\frac{1}{8}$	10	$2\frac{1}{8}$
2	$1\frac{1}{4}$	7	$0\frac{3}{4}$	2	$5\frac{1}{4}$	8	$1\frac{3}{8}$	2	$9\frac{1}{4}$	9	$1\frac{7}{8}$	3	$1\frac{1}{4}$	10	$2\frac{1}{2}$
2	$1\frac{3}{8}$	7	$1\frac{1}{8}$	2	$5\frac{3}{8}$	8	$1\frac{3}{4}$	2	$9\frac{3}{8}$	9	$2\frac{3}{8}$	3	$1\frac{3}{8}$	10	$2\frac{7}{8}$
2	$1\frac{1}{2}$	7	$1\frac{1}{2}$	2	$5\frac{1}{2}$	8	$2\frac{1}{8}$	2	$9\frac{1}{2}$	9	$2\frac{3}{4}$	3	$1\frac{1}{2}$	10	$3\frac{1}{4}$
2	$1\frac{5}{8}$	7	2	2	$5\frac{5}{8}$	8	$2\frac{1}{2}$	2	$9\frac{5}{8}$	9	$3\frac{1}{8}$	3	$1\frac{5}{8}$	10	$3\frac{5}{8}$
2	$1\frac{3}{4}$	7	$2\frac{3}{8}$	2	$5\frac{3}{4}$	8	$2\frac{7}{8}$	2	$9\frac{3}{4}$	9	$3\frac{1}{2}$	3	$1\frac{3}{4}$	10	4
2	$1\frac{7}{8}$	7	$2\frac{3}{4}$	2	$5\frac{7}{8}$	8	$3\frac{3}{8}$	2	$9\frac{7}{8}$	9	$3\frac{7}{8}$	3	$1\frac{7}{8}$	10	$4\frac{1}{2}$
2	2	7	$3\frac{1}{8}$	2	6	8	$3\frac{3}{4}$	2	10	9	$4\frac{1}{4}$	3	2	10	$4\frac{7}{8}$
2	$2\frac{1}{8}$	7	$3\frac{1}{2}$	2	$6\frac{1}{8}$	8	$4\frac{1}{8}$	2	$10\frac{1}{8}$	9	$4\frac{5}{8}$	3	$2\frac{1}{8}$	10	$5\frac{1}{4}$
2	$2\frac{1}{4}$	7	$3\frac{7}{8}$	2	$6\frac{1}{4}$	8	$4\frac{1}{2}$	2	$10\frac{1}{4}$	9	5	3	$2\frac{1}{4}$	10	$5\frac{5}{8}$
2	$2\frac{3}{8}$	7	$4\frac{3}{8}$	2	$6\frac{3}{8}$	8	$4\frac{7}{8}$	2	$10\frac{3}{8}$	9	$5\frac{1}{2}$	3	$2\frac{3}{8}$	10	6
2	$2\frac{1}{2}$	7	$4\frac{3}{4}$	2	$6\frac{1}{2}$	8	$5\frac{1}{4}$	2	$10\frac{1}{2}$	9	$5\frac{7}{8}$	3	$2\frac{1}{2}$	10	$6\frac{3}{8}$
2	$2\frac{5}{8}$	7	$5\frac{1}{8}$	2	$6\frac{5}{8}$	8	$5\frac{5}{8}$	2	$10\frac{5}{8}$	9	$6\frac{1}{4}$	3	$2\frac{5}{8}$	10	$6\frac{7}{8}$
2	$2\frac{3}{4}$	7	$5\frac{1}{2}$	2	$6\frac{3}{4}$	8	6	2	$10\frac{3}{4}$	9	$6\frac{5}{8}$	3	$2\frac{3}{4}$	10	$7\frac{1}{4}$
2	$2\frac{7}{8}$	7	$5\frac{7}{8}$	2	$6\frac{7}{8}$	8	$6\frac{1}{2}$	2	$10\frac{7}{8}$	9	7	3	$2\frac{7}{8}$	10	$7\frac{5}{8}$
2	3	7	$6\frac{1}{4}$	2	7	8	$6\frac{7}{8}$	2	11	9	$7\frac{3}{8}$	3	3	10	8
2	$3\frac{1}{8}$	7	$6\frac{5}{8}$	2	$7\frac{1}{8}$	8	$7\frac{1}{4}$	2	$11\frac{1}{8}$	9	$7\frac{7}{8}$	3	$3\frac{1}{8}$	10	$8\frac{3}{8}$
2	$3\frac{1}{4}$	7	7	2	$7\frac{1}{4}$	8	$7\frac{5}{8}$	2	$11\frac{1}{4}$	9	$8\frac{1}{4}$	3	$3\frac{1}{4}$	10	$8\frac{3}{4}$
2	$3\frac{3}{8}$	7	$7\frac{1}{2}$	2	$7\frac{3}{8}$	8	8	2	$11\frac{3}{8}$	9	$8\frac{5}{8}$	3	$3\frac{3}{8}$	10	$9\frac{1}{8}$
2	$3\frac{1}{2}$	7	$7\frac{7}{8}$	2	$7\frac{1}{2}$	8	$8\frac{3}{8}$	2	$11\frac{1}{2}$	9	9	3	$3\frac{1}{2}$	10	$9\frac{1}{2}$
2	$3\frac{5}{8}$	7	$8\frac{1}{4}$	2	$7\frac{5}{8}$	8	$8\frac{7}{8}$	2	$11\frac{5}{8}$	9	$9\frac{3}{8}$	3	$3\frac{5}{8}$	10	$9\frac{7}{8}$
2	$3\frac{3}{4}$	7	$8\frac{5}{8}$	2	$7\frac{3}{4}$	8	$9\frac{1}{4}$	2	$11\frac{3}{4}$	9	$9\frac{3}{4}$	3	$3\frac{3}{4}$	10	$10\frac{3}{8}$
2	$3\frac{7}{8}$	7	9	2	$7\frac{7}{8}$	8	$9\frac{5}{8}$	2	$11\frac{7}{8}$	9	$10\frac{1}{8}$	3	$3\frac{7}{8}$	10	$10\frac{3}{4}$
2	4	7	$9\frac{3}{8}$	2	8	8	10	3	0	9	$10\frac{1}{2}$	3	4	10	$11\frac{1}{8}$
2	$4\frac{1}{8}$	7	$9\frac{3}{4}$	2	$8\frac{1}{8}$	8	$10\frac{3}{8}$	3	$0\frac{1}{8}$	9	$10\frac{7}{8}$	3	$4\frac{1}{8}$	10	$11\frac{1}{2}$
2	$4\frac{1}{4}$	7	$10\frac{1}{4}$	2	$8\frac{1}{4}$	8	$10\frac{3}{4}$	3	$0\frac{1}{4}$	9	$11\frac{3}{8}$	3	$4\frac{1}{4}$	10	$11\frac{7}{8}$
2	$4\frac{3}{8}$	7	$10\frac{5}{8}$	2	$8\frac{3}{8}$	8	$11\frac{1}{8}$	3	$0\frac{3}{8}$	9	$11\frac{3}{4}$	3	$4\frac{3}{8}$	11	$0\frac{3}{8}$
2	$4\frac{1}{2}$	7	11	2	$8\frac{1}{2}$	8	$11\frac{1}{2}$	3	$0\frac{1}{2}$	10	$0\frac{1}{8}$	3	$4\frac{1}{2}$	11	$0\frac{3}{4}$
2	$4\frac{5}{8}$	7	$11\frac{3}{8}$	2	$8\frac{5}{8}$	9	0	3	$0\frac{5}{8}$	10	$0\frac{1}{2}$	3	$4\frac{5}{8}$	11	$1\frac{1}{8}$
2	$4\frac{3}{4}$	7	$11\frac{3}{4}$	2	$8\frac{3}{4}$	9	$0\frac{3}{8}$	3	$0\frac{3}{4}$	10	$0\frac{7}{8}$	3	$4\frac{3}{4}$	11	$1\frac{1}{2}$
2	$4\frac{7}{8}$	8	$0\frac{1}{8}$	2	$8\frac{7}{8}$	9	$0\frac{3}{4}$	3	$0\frac{7}{8}$	10	$1\frac{3}{8}$	3	$4\frac{7}{8}$	11	$1\frac{7}{8}$

For Angle Iron measuring $\frac{7}{8}$ of an Inch thick, diagonally across the root.

FLANGE OUTSIDE.

Inside Diameter of Ring.		Length required for Ring.		Inside Diameter of Ring.		Length required for Ring.		Inside Diameter of Ring.		Length required for Ring.		Inside Diameter of Ring.		Length required for Ring.	
Ft.	In.	Ft.	In.	Ft.	In.	Ft.	In.	Ft.	In.	Ft.	In.	Ft.	In.	Ft.	In.
3	5	11	2¼	3	9	12	2⅞	4	1	13	3⅜	4	5	14	4
3	5⅛	11	2⅝	3	9⅛	12	3¼	4	1⅛	13	3¾	4	5⅛	14	4⅜
3	5¼	11	3	3	9¼	12	3⅝	4	1¼	13	4¼	4	5¼	14	4¾
3	5⅜	11	3½	3	9⅜	12	4	4	1⅜	13	4⅝	4	5⅜	14	5⅛
3	5½	11	3⅞	3	9½	12	4⅜	4	1½	13	5	4	5½	14	5½
3	5⅝	11	4¼	3	9⅝	12	4¾	4	1⅝	13	5⅜	4	5⅝	14	5⅞
3	5¾	11	4⅝	3	9¾	12	5¼	4	1¾	13	5¾	4	5¾	14	6⅜
3	5⅞	11	5	3	9⅞	12	5⅝	4	1⅞	13	6⅛	4	5⅞	14	6¾
3	6	11	5⅜	3	10	12	6	4	2	13	6½	4	6	14	7⅛
3	6⅛	11	5¾	3	10⅛	12	6⅜	4	2⅛	13	7	4	6⅛	14	7½
3	6¼	11	6¼	3	10¼	12	6¾	4	2¼	13	7⅜	4	6¼	14	7⅞
3	6⅜	11	6⅝	3	10⅜	12	7⅛	4	2⅜	13	7¾	4	6⅜	14	8¼
3	6½	11	7	3	10½	12	7½	4	2½	13	8⅛	4	6½	14	8¾
3	6⅝	11	7⅜	3	10⅝	12	7⅞	4	2⅝	13	8½	4	6⅝	14	9⅛
3	6¾	11	7¾	3	10¾	12	8⅜	4	2¾	13	8⅞	4	6¾	14	9½
3	6⅞	11	8⅛	3	10⅞	12	8¾	4	2⅞	13	9¼	4	6⅞	14	9⅞
3	7	11	8½	3	11	12	9⅛	4	3	13	9⅝	4	7	14	10¼
3	7⅛	11	8⅞	3	11⅛	12	9½	4	3⅛	13	10⅛	4	7⅛	14	10⅝
3	7¼	11	9⅜	3	11¼	12	9⅞	4	3¼	13	10½	4	7¼	14	11
3	7⅜	11	9¾	3	11⅜	12	10⅜	4	3⅜	13	10⅞	4	7⅜	14	11½
3	7½	11	10⅛	3	11½	12	10¾	4	3½	13	11¼	4	7½	14	11⅞
3	7⅝	11	10½	3	11⅝	12	11⅛	4	3⅝	13	11⅝	4	7⅝	15	0¼
3	7¾	11	10⅞	3	11¾	12	11½	4	3¾	14	0	4	7¾	15	0⅝
3	7⅞	11	11¼	3	11⅞	12	11⅞	4	3⅞	14	0⅜	4	7⅞	15	1
3	8	11	11⅝	4	0	13	0¼	4	4	14	0⅞	4	8	15	1⅜
3	8⅛	12	0⅛	4	0⅛	13	0⅝	4	4⅛	14	1¼	4	8⅛	15	1⅞
3	8¼	12	0½	4	0¼	13	1	4	4¼	14	1⅝	4	8¼	15	2¼
3	8⅜	12	0⅞	4	0⅜	13	1½	4	4⅜	14	2	4	8⅜	15	2⅝
3	8½	12	1¼	4	0½	13	1⅞	4	4½	14	2⅜	4	8½	15	3
3	8⅝	12	1⅝	4	0⅝	13	2¼	4	4⅝	14	2¾	4	8⅝	15	3⅜
3	8¾	12	2	4	0¾	13	2⅝	4	4¾	14	3⅛	4	8¾	15	3¾
3	8⅞	12	2⅜	4	0⅞	13	3	4	4⅞	14	3½	4	8⅞	15	4⅛

For Angle Iron measuring $\frac{1}{8}$ of an Inch thick, diagonally across the root.

FLANGE OUTSIDE.

Inside Diameter of Ring.		Length required for Ring.		Inside Diameter of Ring.		Length required for Ring.		Inside Diameter of Ring.		Length required for Ring.		Inside Diameter of Ring.		Length required for Ring.	
Ft.	In.	Ft.	In.	Ft.	In.	Ft.	In.	Ft.	In.	Ft.	In.	Ft.	In.	Ft.	In.
4	9	15	4½	5	1	16	5⅛	5	5	17	5⅝	5	9	18	6¼
4	9⅛	15	4⅞	5	1⅛	16	5½	5	5⅛	17	6	5	9⅛	18	6⅝
4	9¼	15	5⅜	5	1¼	16	5⅞	5	5¼	17	6½	5	9¼	18	7
4	9⅜	15	5¾	5	1⅜	16	6¼	5	5⅜	17	6⅞	5	9⅜	18	7⅜
4	9½	15	6⅛	5	1½	16	6⅝	5	5½	17	7¼	5	9½	18	7⅞
4	9⅝	15	6½	5	1⅝	16	7	5	5⅝	17	7⅝	5	9⅝	18	8¼
4	9¾	15	6⅞	5	1¾	16	7½	5	5¾	17	8	5	9¾	18	8⅝
4	9⅞	15	7¼	5	1⅞	16	7⅞	5	5⅞	17	8⅜	5	9⅞	18	9
4	10	15	7¾	5	2	16	8¼	5	6	17	8⅞	5	10	18	9⅜
4	10⅛	15	8⅛	5	2⅛	16	8⅝	5	6⅛	17	9¼	5	10⅛	18	9¾
4	10¼	15	8½	5	2¼	16	9	5	6¼	17	9⅝	5	10¼	18	10⅛
4	10⅜	15	8⅞	5	2⅜	16	9⅜	5	6⅜	17	10	5	10⅜	18	10½
4	10½	15	9¼	5	2½	16	9⅞	5	6½	17	10⅜	5	10½	18	11
4	10⅝	15	9⅝	5	2⅝	16	10¼	5	6⅝	17	10¾	5	10⅝	18	11⅜
4	10¾	15	10	5	2¾	16	10⅝	5	6¾	17	11⅛	5	10¾	18	11¾
4	10⅞	15	10⅜	5	2⅞	16	11	5	6⅞	17	11½	5	10⅞	19	0⅛
4	11	15	10⅞	5	3	16	11⅜	5	7	18	0	5	11	19	0½
4	11⅛	15	11¼	5	3⅛	16	11¾	5	7⅛	18	0⅜	5	11⅛	19	0⅞
4	11¼	15	11⅝	5	3¼	17	0⅛	5	7¼	18	0¾	5	11¼	19	1⅜
4	11⅜	16	0	5	3⅜	17	0⅝	5	7⅜	18	1⅛	5	11⅜	19	1¾
4	11½	16	0⅜	5	3½	17	1	5	7½	18	1½	5	11½	19	2⅛
4	11⅝	16	0¾	5	3⅝	17	1⅜	5	7⅝	18	1⅞	5	11⅝	19	2½
4	11¾	16	1⅛	5	3¾	17	1¾	5	7¾	18	2⅜	5	11¾	19	2⅞
4	11⅞	16	1⅝	5	3⅞	17	2⅛	5	7⅞	18	2¾	5	11⅞	19	3¼
5	0	16	2	5	4	17	2½	5	8	18	3⅛	6	0	19	3⅝
5	0⅛	16	2⅜	5	4⅛	17	2⅞	5	8⅛	18	3½	6	0⅛	19	4
5	0¼	16	2¾	5	4¼	17	3⅜	5	8¼	18	3⅞	6	0¼	19	4½
5	0⅜	16	3⅛	5	4⅜	17	3¾	5	8⅜	18	4¼	6	0⅜	19	4⅞
5	0½	16	3½	5	4½	17	4⅛	5	8½	18	4⅝	6	0½	19	5¼
5	0⅝	16	3⅞	5	4⅝	17	4½	5	8⅝	18	5	6	0⅝	19	5⅝
5	0¾	16	4⅜	5	4¾	17	4⅞	5	8¾	18	5½	6	0¾	19	6
5	0⅞	16	4¾	5	4⅞	17	5¼	5	8⅞	18	5⅞	6	0⅞	19	6⅜

For Angle Iron measuring $\frac{1}{8}$ of an Inch thick, diagonally across the root.

FLANGE OUTSIDE.

INSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.		INSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.		INSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.		INSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.	
FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.
6	1	19	6 7/16	6	5	20	7 3/8	6	9	21	8	7	1	22	8 1/2
6	1 1/8	19	7 1/4	6	5 1/8	20	7 3/4	6	9 1/8	21	8 3/8	7	1 1/8	22	8 7/8
6	1 1/4	19	7 9/16	6	5 1/4	20	8 1/8	6	9 1/4	21	8 3/4	7	1 1/4	22	9 1/4
6	1 3/8	19	8	6	5 3/8	20	8 1/2	6	9 3/8	21	9 1/8	7	1 3/8	22	9 3/4
6	1 1/2	19	8 3/8	6	5 1/2	20	9	6	9 1/2	21	9 1/2	7	1 1/2	22	10 1/8
6	1 5/8	19	8 3/4	6	5 5/8	20	9 3/8	6	9 5/8	21	9 7/8	7	1 5/8	22	10 1/2
6	1 3/4	19	9 1/16	6	5 3/4	20	9 3/4	6	9 3/4	21	10 3/8	7	1 3/4	22	10 7/8
6	1 7/8	19	9 5/8	6	5 7/8	20	10 1/8	6	9 7/8	21	10 3/4	7	1 7/8	22	11 1/4
6	2	19	10	6	6	20	10 1/2	6	10	21	11 1/8	7	2	22	11 5/8
6	2 1/16	19	10 3/8	6	6 1/8	20	10 7/16	6	10 1/8	21	11 1/2	7	2 1/8	23	0
6	2 1/4	19	10 3/4	6	6 1/4	20	11 5/8	6	10 1/4	21	11 7/8	7	2 1/4	23	0 1/2
6	2 3/8	19	11 1/8	6	6 3/8	20	11 3/4	6	10 3/8	22	0 1/4	7	2 3/8	23	0 7/8
6	2 1/2	19	11 1/2	6	6 1/2	21	0 1/16	6	10 1/2	22	0 5/8	7	2 1/2	23	1 1/4
6	2 5/8	19	11 7/16	6	6 5/8	21	0 1/2	6	10 5/8	22	1	7	2 5/8	23	1 5/8
6	2 7/16	20	0 3/8	6	6 3/4	21	0 7/16	6	10 3/4	22	1 1/2	7	2 3/4	23	2
6	2 1/8	20	0 3/4	6	6 7/8	21	1 1/4	6	10 7/8	22	1 7/8	7	2 7/8	23	2 3/8
6	3	20	1 1/16	6	7	21	1 5/16	6	11	22	2 1/4	7	3	23	2 3/4
6	3 1/16	20	1 1/2	6	7 1/8	21	2	6	11 1/8	22	2 5/8	7	3 1/8	23	3 1/4
6	3 1/4	20	1 7/16	6	7 1/4	21	2 1/2	6	11 1/4	22	3	7	3 1/4	23	3 5/8
6	3 3/8	20	2 1/4	6	7 3/8	21	2 7/16	6	11 3/8	22	3 3/8	7	3 3/8	23	4
6	3 1/2	20	2 5/8	6	7 1/2	21	3 1/4	6	11 1/2	22	3 7/8	7	3 1/2	23	4 3/8
6	3 5/8	20	3	6	7 5/8	21	3 5/8	6	11 5/8	22	4 1/4	7	3 5/8	23	4 3/4
6	3 3/4	20	3 1/2	6	7 3/4	21	4	6	11 3/4	22	4 5/8	7	3 3/4	23	5 1/8
6	3 7/8	20	3 7/8	6	7 7/8	21	4 3/8	6	11 7/8	22	5	7	3 7/8	23	5 1/2
6	4	20	4 1/4	6	8	21	4 3/4	7	0	22	5 3/8	7	4	23	6
6	4 1/8	20	4 5/8	6	8 1/8	21	5 1/8	7	0 1/8	22	5 3/4	7	4 1/8	23	6 3/8
6	4 1/4	20	5	6	8 1/4	21	5 1/2	7	0 1/4	22	6 1/8	7	4 1/4	23	6 3/4
6	4 3/8	20	5 3/8	6	8 3/8	21	6	7	0 3/8	22	6 1/2	7	4 3/8	23	7 1/8
6	4 1/2	20	5 7/8	6	8 1/2	21	6 3/8	7	0 1/2	22	7	7	4 1/2	23	7 1/2
6	4 5/8	20	6 1/4	6	8 5/8	21	6 3/4	7	0 5/8	22	7 3/8	7	4 5/8	23	7 7/8
6	4 3/4	20	6 5/8	6	8 3/4	21	7 1/16	7	0 3/4	22	7 3/4	7	4 3/4	23	8 1/4
6	4 7/8	20	7	6	8 7/8	21	7 5/8	7	0 7/8	22	8 1/8	7	4 7/8	23	8 3/4

For Angle Iron measuring $\frac{7}{8}$ of an Inch thick, diagonally across the root.

FLANGE OUTSIDE.

INSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.		INSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.		INSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.		INSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.	
FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.
7	5	23	$9\frac{1}{8}$	7	9	24	$9\frac{5}{8}$	8	1	25	$10\frac{1}{4}$	8	5	26	$10\frac{3}{4}$
7	$5\frac{1}{8}$	23	$9\frac{1}{2}$	7	$9\frac{1}{8}$	24	10	8	$1\frac{1}{8}$	25	$10\frac{5}{8}$	8	$5\frac{1}{8}$	26	$11\frac{1}{8}$
7	$5\frac{1}{4}$	23	$9\frac{7}{8}$	7	$9\frac{1}{4}$	24	$10\frac{1}{8}$	8	$1\frac{1}{4}$	25	11	8	$5\frac{1}{4}$	26	$11\frac{1}{2}$
7	$5\frac{3}{8}$	23	$10\frac{1}{4}$	7	$9\frac{3}{8}$	24	$10\frac{7}{8}$	8	$1\frac{3}{8}$	25	$11\frac{3}{8}$	8	$5\frac{3}{8}$	27	0
7	$5\frac{1}{2}$	23	$10\frac{5}{8}$	7	$9\frac{1}{2}$	24	$11\frac{1}{4}$	8	$1\frac{1}{2}$	25	$11\frac{3}{4}$	8	$5\frac{1}{2}$	27	$0\frac{3}{8}$
7	$5\frac{5}{8}$	23	11	7	$9\frac{5}{8}$	24	$11\frac{5}{8}$	8	$1\frac{5}{8}$	26	$0\frac{1}{8}$	8	$5\frac{5}{8}$	27	$0\frac{3}{4}$
7	$5\frac{3}{4}$	23	$11\frac{1}{2}$	7	$9\frac{3}{4}$	25	0	8	$1\frac{3}{4}$	26	$0\frac{5}{8}$	8	$5\frac{3}{4}$	27	$1\frac{1}{8}$
7	$5\frac{7}{8}$	23	$11\frac{7}{8}$	7	$9\frac{7}{8}$	25	$0\frac{3}{8}$	8	$1\frac{7}{8}$	26	1	8	$5\frac{7}{8}$	27	$1\frac{1}{2}$
7	6	24	$0\frac{1}{4}$	7	10	25	$0\frac{3}{4}$	8	2	26	$1\frac{3}{8}$	8	6	27	$1\frac{7}{8}$
7	$6\frac{1}{8}$	24	$0\frac{5}{8}$	7	$10\frac{1}{8}$	25	$1\frac{1}{4}$	8	$2\frac{1}{8}$	26	$1\frac{3}{4}$	8	$6\frac{1}{8}$	27	$2\frac{3}{8}$
7	$6\frac{1}{4}$	24	1	7	$10\frac{1}{4}$	25	$1\frac{5}{8}$	8	$2\frac{1}{4}$	26	$2\frac{1}{8}$	8	$6\frac{1}{4}$	27	$2\frac{3}{4}$
7	$6\frac{3}{8}$	24	$1\frac{3}{8}$	7	$10\frac{3}{8}$	25	2	8	$2\frac{3}{8}$	26	$2\frac{1}{2}$	8	$6\frac{3}{8}$	27	$3\frac{1}{8}$
7	$6\frac{1}{2}$	24	$1\frac{3}{4}$	7	$10\frac{1}{2}$	25	$2\frac{3}{8}$	8	$2\frac{1}{2}$	26	$2\frac{7}{8}$	8	$6\frac{1}{2}$	27	$3\frac{1}{2}$
7	$6\frac{5}{8}$	24	$2\frac{1}{4}$	7	$10\frac{5}{8}$	25	$2\frac{3}{4}$	8	$2\frac{5}{8}$	26	$3\frac{3}{8}$	8	$6\frac{5}{8}$	27	$3\frac{7}{8}$
7	$6\frac{3}{4}$	24	$2\frac{5}{8}$	7	$10\frac{3}{4}$	25	$3\frac{1}{8}$	8	$2\frac{3}{4}$	26	$3\frac{3}{4}$	8	$6\frac{3}{4}$	27	$4\frac{1}{4}$
7	$6\frac{7}{8}$	24	3	7	$10\frac{7}{8}$	25	$3\frac{1}{2}$	8	$2\frac{7}{8}$	26	$4\frac{1}{8}$	8	$6\frac{7}{8}$	27	$4\frac{5}{8}$
7	7	24	$3\frac{3}{8}$	7	11	25	$3\frac{7}{8}$	8	3	26	$4\frac{1}{2}$	8	7	27	5
7	$7\frac{1}{8}$	24	$3\frac{3}{4}$	7	$11\frac{1}{8}$	25	$4\frac{3}{8}$	8	$3\frac{1}{8}$	26	$4\frac{7}{8}$	8	$7\frac{1}{8}$	27	$5\frac{1}{2}$
7	$7\frac{1}{4}$	24	$4\frac{1}{8}$	7	$11\frac{1}{4}$	25	$4\frac{3}{4}$	8	$3\frac{1}{4}$	26	$5\frac{1}{4}$	8	$7\frac{1}{4}$	27	$5\frac{7}{8}$
7	$7\frac{3}{8}$	24	$4\frac{1}{2}$	7	$11\frac{3}{8}$	25	$5\frac{1}{8}$	8	$3\frac{3}{8}$	26	$5\frac{5}{8}$	8	$7\frac{3}{8}$	27	$6\frac{1}{4}$
7	$7\frac{1}{2}$	24	$4\frac{7}{8}$	7	$11\frac{1}{2}$	25	$5\frac{1}{2}$	8	$3\frac{1}{2}$	26	6	8	$7\frac{1}{2}$	27	$6\frac{5}{8}$
7	$7\frac{5}{8}$	24	$5\frac{3}{8}$	7	$11\frac{5}{8}$	25	$5\frac{7}{8}$	8	$3\frac{5}{8}$	26	$6\frac{1}{2}$	8	$7\frac{5}{8}$	27	7
7	$7\frac{3}{4}$	24	$5\frac{3}{4}$	7	$11\frac{3}{4}$	25	$6\frac{1}{4}$	8	$3\frac{3}{4}$	26	$6\frac{7}{8}$	8	$7\frac{3}{4}$	27	$7\frac{3}{8}$
7	$7\frac{7}{8}$	24	$6\frac{1}{8}$	7	$11\frac{7}{8}$	25	$6\frac{5}{8}$	8	$3\frac{7}{8}$	26	$7\frac{1}{4}$	8	$7\frac{7}{8}$	27	$7\frac{7}{8}$
7	8	24	$6\frac{1}{2}$	8	0	25	7	8	4	26	$7\frac{5}{8}$	8	8	27	$8\frac{1}{4}$
7	$8\frac{1}{8}$	24	$6\frac{7}{8}$	8	$0\frac{1}{8}$	25	$7\frac{1}{2}$	8	$4\frac{1}{8}$	26	8	8	$8\frac{1}{8}$	27	$8\frac{5}{8}$
7	$8\frac{1}{4}$	24	$7\frac{1}{4}$	8	$0\frac{1}{4}$	25	$7\frac{7}{8}$	8	$4\frac{1}{4}$	26	$8\frac{3}{8}$	8	$8\frac{1}{4}$	27	9
7	$8\frac{3}{8}$	24	$7\frac{5}{8}$	8	$0\frac{3}{8}$	25	$8\frac{1}{4}$	8	$4\frac{3}{8}$	26	$8\frac{7}{8}$	8	$8\frac{3}{8}$	27	$9\frac{3}{8}$
7	$8\frac{1}{2}$	24	8	8	$0\frac{1}{2}$	25	$8\frac{5}{8}$	8	$4\frac{1}{2}$	26	$9\frac{1}{4}$	8	$8\frac{1}{2}$	27	$9\frac{3}{4}$
7	$8\frac{5}{8}$	24	$8\frac{1}{2}$	8	$0\frac{5}{8}$	25	9	8	$4\frac{5}{8}$	26	$9\frac{5}{8}$	8	$8\frac{5}{8}$	27	$10\frac{1}{8}$
7	$8\frac{3}{4}$	24	$8\frac{7}{8}$	8	$0\frac{3}{4}$	25	$9\frac{1}{2}$	8	$4\frac{3}{4}$	26	10	8	$8\frac{3}{4}$	27	$10\frac{5}{8}$
7	$8\frac{7}{8}$	24	$9\frac{1}{4}$	8	$0\frac{7}{8}$	25	$9\frac{7}{8}$	8	$4\frac{7}{8}$	26	$10\frac{3}{8}$	8	$8\frac{7}{8}$	27	11

TABLE VII.,

For Angle Iron measuring 1 Inch thick, diagonally across the root.

FLANGE OUTSIDE.

INSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.		INSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.		INSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.		INSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.	
FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.
0	9	2	10½	1	1	3	11⅛	1	5	4	11⅝	1	9	6	0¼
0	9⅛	2	10⅞	1	1⅛	3	11½	1	5⅛	5	0	1	9⅛	6	0⅝
0	9¼	2	11⅜	1	1¼	3	11⅞	1	5¼	5	0⅜	1	9¼	6	1
0	9⅜	2	11¾	1	1⅜	4	0¼	1	5⅜	5	0⅞	1	9⅜	6	1⅜
0	9½	3	0⅛	1	1½	4	0⅝	1	5½	5	1¼	1	9½	6	1¾
0	9⅝	3	0½	1	1⅝	4	1	1	5⅝	5	1⅝	1	9⅝	6	2¼
0	9¾	3	0⅞	1	1¾	4	1⅜	1	5¾	5	2	1	9¾	6	2⅝
0	9⅞	3	1¼	1	1⅞	4	1⅞	1	5⅞	5	2⅜	1	9⅞	6	3
0	10	3	1⅝	1	2	4	2¼	1	6	5	2¾	1	10	6	3⅜
0	10⅛	3	2	1	2⅛	4	2⅝	1	6⅛	5	3⅛	1	10⅛	6	3¾
0	10¼	3	2½	1	2¼	4	3	1	6¼	5	3⅝	1	10¼	6	4⅛
0	10⅜	3	2⅞	1	2⅜	4	3⅜	1	6⅜	5	4	1	10⅜	6	4½
0	10½	3	3¼	1	2½	4	3¾	1	6½	5	4⅜	1	10½	6	4⅞
0	10⅝	3	3⅝	1	2⅝	4	4⅛	1	6⅝	5	4¾	1	10⅝	6	5⅜
0	10¾	3	4	1	2¾	4	4½	1	6¾	5	5⅛	1	10¾	6	5¾
0	10⅞	3	4⅜	1	2⅞	4	5	1	6⅞	5	5½	1	10⅞	6	6⅛
0	11	3	4⅞	1	3	4	5⅜	1	7	5	5⅞	1	11	6	6½
0	11⅛	3	5¼	1	3⅛	4	5¾	1	7⅛	5	6⅜	1	11⅛	6	6⅞
0	11¼	3	5⅝	1	3¼	4	6⅛	1	7¼	5	6¾	1	11¼	6	7¼
0	11⅜	3	6	1	3⅜	4	6½	1	7⅜	5	7⅛	1	11⅜	6	7⅝
0	11½	3	6⅜	1	3½	4	7	1	7½	5	7½	1	11½	6	8⅛
0	11⅝	3	6¾	1	3⅝	4	7⅜	1	7⅝	5	8	1	11⅝	6	8½
0	11¾	3	7⅛	1	3¾	4	7¾	1	7¾	5	8⅜	1	11¾	6	8⅞
0	11⅞	3	7⅝	1	3⅞	4	8⅛	1	7⅞	5	8¾	1	11⅞	6	9¼
1	0	3	8	1	4	4	8½	1	8	5	9⅛	2	0	6	9⅝
1	0⅛	3	8⅜	1	4⅛	4	8⅞	1	8⅛	5	9½	2	0⅛	6	10
1	0¼	3	8¾	1	4¼	4	9¼	1	8¼	5	9⅞	2	0¼	6	10½
1	0⅜	3	9⅛	1	4⅜	4	9⅝	1	8⅜	5	10¼	2	0⅜	6	10⅞
1	0½	3	9½	1	4½	4	10⅛	1	8½	5	10⅝	2	0½	6	11¼
1	0⅝	3	9⅞	1	4⅝	4	10½	1	8⅝	5	11	2	0⅝	6	11⅝
1	0¾	3	10⅜	1	4¾	4	10⅞	1	8¾	5	11½	2	0¾	7	0
1	0⅞	3	10¾	1	4⅞	4	11¼	1	8⅞	5	11⅞	2	0⅞	7	0⅜

For Angle Iron measuring 1 Inch thick, diagonally across the root.

FLANGE OUTSIDE.

Inside Diameter of Ring.		Length Required for Ring.		Inside Diameter of Ring.		Length Required for Ring.		Inside Diameter of Ring.		Length Required for Ring.		Inside Diameter of Ring.		Length Required for Ring.	
Ft.	In.	Ft.	In.	Ft.	In.	Ft.	In.	Ft.	In.	Ft.	In.	Ft.	In.	Ft.	In.
2	1	7	0¾	2	5	8	1⅜	2	9	9	1⅞	3	1	10	2½
2	1⅛	7	1⅛	2	5⅛	8	1¾	2	9⅛	9	2⅜	3	1⅛	10	2⅞
2	1¼	7	1½	2	5¼	8	2⅛	2	9¼	9	2¾	3	1¼	10	3¼
2	1⅜	7	2	2	5⅜	8	2½	2	9⅜	9	3⅛	3	1⅜	10	3⅝
2	1½	7	2⅜	2	5½	8	2⅞	2	9½	9	3½	3	1½	10	4
2	1⅝	7	2¾	2	5⅝	8	3⅜	2	9⅝	9	3⅞	3	1⅝	10	4½
2	1¾	7	3⅛	2	5¾	8	3¾	2	9¾	9	4¼	3	1¾	10	4⅞
2	1⅞	7	3½	2	5⅞	8	4⅛	2	9⅞	9	4⅝	3	1⅞	10	5¼
2	2	7	3⅞	2	6	8	4½	2	10	9	5	3	2	10	5⅝
2	2⅛	7	4⅜	2	6⅛	8	4⅞	2	10⅛	9	5½	3	2⅛	10	6
2	2¼	7	4¾	2	6¼	8	5¼	2	10¼	9	5⅞	3	2¼	10	6⅜
2	2⅜	7	5⅛	2	6⅜	8	5⅝	2	10⅜	9	6¼	3	2⅜	10	6⅞
2	2½	7	5½	2	6½	8	6	2	10½	9	6⅝	3	2½	10	7¼
2	2⅝	7	5⅞	2	6⅝	8	6½	2	10⅝	9	7	3	2⅝	10	7⅝
2	2¾	7	6¼	2	6¾	8	6⅞	2	10¾	9	7⅜	3	2¾	10	8
2	2⅞	7	6⅝	2	6⅞	8	7¼	2	10⅞	9	7⅞	3	2⅞	10	8⅜
2	3	7	7	2	7	8	7⅝	2	11	9	8¼	3	3	10	8¾
2	3⅛	7	7½	2	7⅛	8	8	2	11⅛	9	8⅝	3	3⅛	10	9⅛
2	3¼	7	7⅞	2	7¼	8	8⅜	2	11¼	9	9	3	3¼	10	9½
2	3⅜	7	8¼	2	7⅜	8	8⅞	2	11⅜	9	9⅜	3	3⅜	10	9⅞
2	3½	7	8⅝	2	7½	8	9¼	2	11½	9	9¾	3	3½	10	10⅜
2	3⅝	7	9	2	7⅝	8	9⅝	2	11⅝	9	10⅛	3	3⅝	10	10¾
2	3¾	7	9⅜	2	7¾	8	10	2	11¾	9	10½	3	3¾	10	11⅛
2	3⅞	7	9¾	2	7⅞	8	10⅜	2	11⅞	9	10⅞	3	3⅞	10	11½
2	4	7	10¼	2	8	8	10¾	3	0	9	11⅜	3	4	10	11⅞
2	4⅛	7	10⅝	2	8⅛	8	11⅛	3	0⅛	9	11¾	3	4⅛	11	0⅜
2	4¼	7	11	2	8¼	8	11½	3	0¼	10	0⅛	3	4¼	11	0¾
2	4⅜	7	11⅜	2	8⅜	9	0	3	0⅜	10	0½	3	4⅜	11	1⅛
2	4½	7	11¾	2	8½	9	0⅜	3	0½	10	0⅞	3	4½	11	1½
2	4⅝	8	0⅛	2	8⅝	9	0¾	3	0⅝	10	1⅜	3	4⅝	11	1⅞
2	4¾	8	0½	2	8¾	9	1⅛	3	0¾	10	1¾	3	4¾	11	2¼
2	4⅞	8	1	2	8⅞	9	1½	3	0⅞	10	2⅛	3	4⅞	11	2⅝

For Angle Iron measuring 1 Inch thick, diagonally across the root.

FLANGE OUTSIDE.

Inside Diameter of Ring.		Length Required for Ring.		Inside Diameter of Ring.		Length Required for Ring.		Inside Diameter of Ring.		Length Required for Ring.		Inside Diameter of Ring.		Length Required for Ring.	
Ft.	In.	Ft.	In.	Ft.	In.	Ft.	In.	Ft.	In.	Ft.	In.	Ft.	In.	Ft.	In.
3	5	11	3	3	9	12	3⅜	4	1	13	4¼	4	5	14	4¾
3	5⅛	11	3½	3	9⅛	12	4	4	1⅛	13	4⅝	4	5⅛	14	5⅛
3	5¼	11	3⅞	3	9¼	12	4⅜	4	1¼	13	5	4	5¼	14	5½
3	5⅜	11	4¼	3	9⅜	12	4¾	4	1⅜	13	5⅜	4	5⅜	14	5⅞
3	5½	11	4⅝	3	9½	12	5¼	4	1½	13	5¾	4	5½	14	6⅜
3	5⅝	11	5	3	9⅝	12	5⅝	4	1⅝	13	6⅛	4	5⅝	14	6¾
3	5¾	11	5⅜	3	9¾	12	6	4	1¾	13	6½	4	5¾	14	7⅛
3	5⅞	11	5¾	3	9⅞	12	6⅜	4	1⅞	13	7	4	5⅞	14	7½
3	6	11	6¼	3	10	12	6¾	4	2	13	7⅜	4	6	14	7⅞
3	6⅛	11	6⅝	3	10⅛	12	7⅛	4	2⅛	13	7¾	4	6⅛	14	8¼
3	6¼	11	7	3	10¼	12	7½	4	2¼	13	8⅛	4	6¼	14	8¾
3	6⅜	11	7⅜	3	10⅜	12	7⅞	4	2⅜	13	8½	4	6⅜	14	9⅛
3	6½	11	7¾	3	10½	12	8⅜	4	2½	13	8⅞	4	6½	14	9½
3	6⅝	11	8⅛	3	10⅝	12	8¾	4	2⅝	13	9¼	4	6⅝	14	9⅞
3	6¾	11	8½	3	10¾	12	9⅛	4	2¾	13	9⅝	4	6¾	14	10¼
3	6⅞	11	8⅞	3	10⅞	12	9½	4	2⅞	13	10⅛	4	6⅞	14	10⅝
3	7	11	9⅜	3	11	12	9⅞	4	3	13	10½	4	7	14	11
3	7⅛	11	9¾	3	11⅛	12	10⅜	4	3⅛	13	10⅞	4	7⅛	14	11½
3	7¼	11	10⅛	3	11¼	12	10¾	4	3¼	13	11¼	4	7¼	14	11⅞
3	7⅜	11	10½	3	11⅜	12	11⅛	4	3⅜	13	11⅝	4	7⅜	15	0¼
3	7½	11	10⅞	3	11½	12	11½	4	3½	14	0	4	7½	15	0⅝
3	7⅝	11	11¼	3	11⅝	12	11⅞	4	3⅝	14	0⅜	4	7⅝	15	1
3	7¾	11	11⅝	3	11¾	13	0⅛	4	3¾	14	0⅞	4	7¾	15	1⅜
3	7⅞	12	0⅛	3	11⅞	13	0⅝	4	3⅞	14	1¼	4	7⅞	15	1⅞
3	8	12	0½	4	0	13	1	4	4	14	1⅝	4	8	15	2¼
3	8⅛	12	0⅞	4	0⅛	13	1½	4	4⅛	14	2	4	8⅛	15	2⅝
3	8¼	12	1¼	4	0¼	13	1⅞	4	4¼	14	2⅜	4	8¼	15	3
3	8⅜	12	1⅝	4	0⅜	13	2¼	4	4⅜	14	2¾	4	8⅜	15	3⅜
3	8½	12	2	4	0½	13	2⅝	4	4½	14	3⅛	4	8½	15	3¾
3	8⅝	12	2⅜	4	0⅝	13	3	4	4⅝	14	3½	4	8⅝	15	4⅛
3	8¾	12	2⅞	4	0¾	13	3⅜	4	4¾	14	4	4	8¾	15	4½
3	8⅞	12	3¼	4	0⅞	13	3¾	4	4⅞	14	4⅜	4	8⅞	15	4⅞

For Angle Iron measuring 1 Inch thick, diagonally across the root.

FLANGE OUTSIDE.

INSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.		INSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.		INSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.		INSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.	
FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.
4	9	15	5 3/8	5	1	16	5 7/8	5	5	17	6 1/2	5	9	18	7
4	9 1/8	15	5 3/4	5	1 1/8	16	6 1/4	5	5 1/8	17	6 7/8	5	9 1/8	18	7 3/8
4	9 1/4	15	6 1/8	5	1 1/4	16	6 5/8	5	5 1/4	17	7 1/4	5	9 1/4	18	7 7/8
4	9 3/8	15	6 1/2	5	1 3/8	16	7	5	5 3/8	17	7 5/8	5	9 3/8	18	8 1/4
4	9 1/2	15	6 7/8	5	1 1/2	16	7 1/2	5	5 1/2	17	8	5	9 1/2	18	8 5/8
4	9 5/8	15	7 1/4	5	1 5/8	16	7 7/8	5	5 5/8	17	8 3/8	5	9 5/8	18	9
4	9 3/4	15	7 3/4	5	1 3/4	16	8 1/4	5	5 3/4	17	8 7/8	5	9 3/4	18	9 3/8
4	9 7/8	15	8 1/8	5	1 7/8	16	8 5/8	5	5 7/8	17	9 1/4	5	9 7/8	18	9 3/4
4	10	15	8 1/2	5	2	16	9	5	6	17	9 5/8	5	10	18	10 1/8
4	10 1/8	15	8 7/8	5	2 1/8	16	9 3/8	5	6 1/8	17	10	5	10 1/8	18	10 1/2
4	10 1/4	15	9 1/4	5	2 1/4	16	9 7/8	5	6 1/4	17	10 3/8	5	10 1/4	18	11
4	10 3/8	15	9 5/8	5	2 3/8	16	10 1/4	5	6 3/8	17	10 3/4	5	10 3/8	18	11 3/8
4	10 1/2	15	10	5	2 1/2	16	10 5/8	5	6 1/2	17	11 1/8	5	10 1/2	18	11 3/4
4	10 5/8	15	10 3/8	5	2 5/8	16	11	5	6 5/8	17	11 1/2	5	10 5/8	19	0 1/8
4	10 3/4	15	10 7/8	5	2 3/4	16	11 3/8	5	6 3/4	18	0	5	10 3/4	19	0 1/2
4	10 7/8	15	11 1/4	5	2 7/8	16	11 3/4	5	6 7/8	18	0 3/8	5	10 7/8	19	0 7/8
4	11	15	11 5/8	5	3	17	0 1/8	5	7	18	0 3/4	5	11	19	1 3/8
4	11 1/8	16	0	5	3 1/8	17	0 5/8	5	7 1/8	18	1 1/8	5	11 1/8	19	1 3/4
4	11 1/4	16	0 3/8	5	3 1/4	17	1	5	7 1/4	18	1 1/2	5	11 1/4	19	2 1/8
4	1 3/8	16	0 3/4	5	3 3/8	17	1 3/8	5	7 3/8	18	1 7/8	5	11 3/8	19	2 1/2
4	1 1/2	16	1 1/8	5	3 1/2	17	1 3/4	5	7 1/2	18	2 3/8	5	11 1/2	19	2 7/8
4	1 5/8	16	1 5/8	5	3 5/8	17	2 1/8	5	7 5/8	18	2 3/4	5	11 5/8	19	3 1/4
4	1 3/4	16	2	5	3 3/4	17	2 1/2	5	7 3/4	18	3 1/8	5	11 3/4	19	3 5/8
4	1 7/8	16	2 3/8	5	3 7/8	17	2 7/8	5	7 7/8	18	3 1/2	5	11 7/8	19	4
5	0	16	2 3/4	5	4	17	3 3/8	5	8	18	3 7/8	6	0	19	4 1/2
5	0 1/8	16	3 1/8	5	4 1/8	17	3 3/4	5	8 1/8	18	4 1/4	6	0 1/8	19	4 7/8
5	0 1/4	16	3 1/2	5	4 1/4	17	4 1/8	5	8 1/4	18	4 5/8	6	0 1/4	19	5 1/4
5	0 3/8	16	3 7/8	5	4 3/8	17	4 1/2	5	8 3/8	18	5	6	0 3/8	19	5 5/8
5	0 1/2	16	4 3/8	5	4 1/2	17	4 7/8	5	8 1/2	18	5 1/2	6	0 1/2	19	6
5	0 5/8	16	4 3/4	5	4 5/8	17	5 1/4	5	8 5/8	18	5 7/8	6	0 5/8	19	6 3/8
5	0 3/4	16	5 1/8	5	4 3/4	17	5 5/8	5	8 3/4	18	6 1/4	6	0 3/4	19	6 7/8
5	0 7/8	16	5 1/2	5	4 7/8	17	6	5	8 7/8	18	6 5/8	6	0 7/8	19	7 1/4

For Angle Iron measuring 1 Inch thick, diagonally across the root.

FLANGE OUTSIDE.

Inside Diameter of Ring		Length Required for Ring.		Inside Diameter of Ring.		Length Required for Ring.		Inside Diameter of Ring.		Length Required for Ring.		Inside Diameter of Ring.		Length Required for Ring.	
Ft.	In.	Ft.	In.	Ft.	In.	Ft.	In.	Ft.	In.	Ft.	In.	Ft.	In.	Ft.	In.
6	1	19	7⅝	6	5	20	8⅛	6	9	21	8¾	7	1	22	9¼
6	1⅛	19	8	6	5⅛	20	8½	6	9⅛	21	9⅛	7	1⅛	22	9¾
6	1¼	19	8⅜	6	5¼	20	9	6	9¼	21	9½	7	1¼	22	10⅛
6	1⅜	19	8¾	6	5⅜	20	9⅜	6	9⅜	21	9⅞	7	1⅜	22	10½
6	1½	19	9⅛	6	5½	20	9¾	6	9½	21	10⅜	7	1½	22	10⅞
6	1⅝	19	9⅝	6	5⅝	20	10⅛	6	9⅝	21	10¾	7	1⅝	22	11¼
6	1¾	19	10	6	5¾	20	10½	6	9¾	21	11⅛	7	1¾	22	11⅝
6	1⅞	19	10⅜	6	5⅞	20	10⅞	6	9⅞	21	11½	7	1⅞	23	0
6	2	19	10¾	6	6	20	11⅜	6	10	21	11⅞	7	2	23	0½
6	2⅛	19	11⅛	6	6⅛	20	11¾	6	10⅛	22	0¼	7	2⅛	23	0⅞
6	2¼	19	11½	6	6¼	21	0⅛	6	10¼	22	0⅝	7	2¼	23	1¼
6	2⅜	19	11⅞	6	6⅜	21	0½	6	10⅜	22	1	7	2⅜	23	1⅝
6	2½	20	0⅜	6	6½	21	0⅞	6	10½	22	1½	7	2½	23	2
6	2⅝	20	0¾	6	6⅝	21	1¼	6	10⅝	22	1⅞	7	2⅝	23	2⅜
6	2¾	20	1⅛	6	6¾	21	1⅝	6	10¾	22	2¼	7	2¾	23	2¾
6	2⅞	20	1½	6	6⅞	21	2	6	10⅞	22	2⅝	7	2⅞	23	3¼
6	3	20	1⅞	6	7	21	2½	6	11	22	3	7	3	23	3⅝
6	3⅛	20	2¼	6	7⅛	21	2⅞	6	11⅛	22	3⅜	7	3⅛	23	4
6	3¼	20	2⅝	6	7¼	21	3¼	6	11¼	22	3⅞	7	3¼	23	4⅜
6	3⅜	20	3	6	7⅜	21	3⅝	6	11⅜	22	4¼	7	3⅜	23	4¾
6	3½	20	3½	6	7½	21	4	6	11½	22	4⅝	7	3½	23	5⅛
6	3⅝	20	3⅞	6	7⅝	21	4⅜	6	11⅝	22	5	7	3⅝	23	5½
6	3¾	20	4¼	6	7¾	21	4¾	6	11¾	22	5⅜	7	3¾	23	6
6	3⅞	20	4⅝	6	7⅞	21	5⅛	6	11⅞	22	5¾	7	3⅞	23	6⅜
6	4	20	5	6	8	21	5½	7	0	22	6⅛	7	4	23	6¾
6	4⅛	20	5⅜	6	8⅛	21	6	7	0⅛	22	6½	7	4⅛	23	7⅛
6	4¼	20	5⅞	6	8¼	21	6⅜	7	0¼	22	7	7	4¼	23	7½
6	4⅜	20	6¼	6	8⅜	21	6¾	7	0⅜	22	7⅜	7	4⅜	23	7⅞
6	4½	20	6⅝	6	8½	21	7⅛	7	0½	22	7¾	7	4½	23	8¼
6	4⅝	20	7	6	8⅝	21	7⅝	7	0⅝	22	8⅛	7	4⅝	23	8¾
6	4¾	20	7⅜	6	8¾	21	8	7	0¾	22	8½	7	4¾	23	9⅛
6	4⅞	20	7¾	6	8⅞	21	8⅜	7	0⅞	22	8⅞	7	4⅞	23	9½

For Angle Iron measuring 1 Inch thick, diagonally across the root.

FLANGE OUTSIDE.

INSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.		INSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.		INSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.		INSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.	
FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.
7	5	23	9 7/8	7	9	24	10 1/2	8	1	25	11	8	5	26	11 1/2
7	5 1/8	23	10 1/4	7	9 1/8	24	10 7/8	8	1 1/8	25	11 3/8	8	5 1/8	27	0
7	5 1/4	23	10 5/8	7	9 1/4	24	11 1/4	8	1 1/4	25	11 3/4	8	5 1/4	27	0 3/8
7	5 3/8	23	11	7	9 3/8	24	11 5/8	8	1 3/8	26	0 1/8	8	5 3/8	27	0 3/4
7	5 1/2	23	11 1/2	7	9 1/2	25	0	8	1 1/2	26	0 5/8	8	5 1/2	27	1 1/8
7	5 5/8	23	11 7/8	7	9 5/8	25	0 3/8	8	1 5/8	26	1	8	5 5/8	27	1 1/2
7	5 3/4	24	0 1/4	7	9 3/4	25	0 3/4	8	1 3/4	26	1 3/8	8	5 3/4	27	1 7/8
7	5 7/8	24	0 5/8	7	9 7/8	25	1 1/4	8	1 7/8	26	1 3/4	8	5 7/8	27	2 3/8
7	6	24	1	7	10	25	1 5/8	8	2	26	2 1/8	8	6	27	2 3/4
7	6 1/8	24	1 3/8	7	10 1/8	25	2	8	2 1/8	26	2 1/2	8	6 1/8	27	3 1/8
7	6 1/4	24	1 3/4	7	10 1/4	25	2 3/8	8	2 1/4	26	2 7/8	8	6 1/4	27	3 1/2
7	6 3/8	24	2 1/4	7	10 3/8	25	2 3/4	8	2 3/8	26	3 3/8	8	6 3/8	27	3 7/8
7	6 1/2	24	2 5/8	7	10 1/2	25	3 1/8	8	2 1/2	26	3 3/4	8	6 1/2	27	4 1/4
7	6 5/8	24	3	7	10 5/8	25	3 1/2	8	2 5/8	26	4 1/8	8	6 5/8	27	4 5/8
7	6 3/4	24	3 3/8	7	10 3/4	25	3 7/8	8	2 3/4	26	4 1/2	8	6 3/4	27	5
7	6 7/8	24	3 3/4	7	10 7/8	25	4 3/8	8	2 7/8	26	4 7/8	8	6 7/8	27	5 1/2
7	7	24	4 1/8	7	11	25	4 3/4	8	3	26	5 1/4	8	7	27	5 7/8
7	7 1/8	24	4 1/2	7	11 1/8	25	5 1/8	8	3 1/8	26	5 5/8	8	7 1/8	27	6 1/4
7	7 1/4	24	4 7/8	7	11 1/4	25	5 1/2	8	3 1/4	26	6	8	7 1/4	27	6 5/8
7	7 3/8	24	5 3/8	7	11 3/8	25	5 7/8	8	3 3/8	26	6 1/2	8	7 3/8	27	7
7	7 1/2	24	5 3/4	7	11 1/2	25	6 1/4	8	3 1/2	26	6 7/8	8	7 1/2	27	7 3/8
7	7 5/8	24	6 1/8	7	11 5/8	25	6 5/8	8	3 5/8	26	7 1/4	8	7 5/8	27	7 7/8
7	7 3/4	24	6 1/2	7	11 3/4	25	7	8	3 3/4	26	7 5/8	8	7 3/4	27	8 1/4
7	7 7/8	24	6 7/8	7	11 7/8	25	7 1/2	8	3 7/8	26	8	8	7 7/8	27	8 5/8
7	8	24	7 1/4	8	0	25	7 7/8	8	4	26	8 3/8	8	8	27	9
7	8 1/8	24	7 5/8	8	0 1/8	25	8 1/4	8	4 1/8	26	8 7/8	8	8 1/8	27	9 3/8
7	8 1/4	24	8	8	0 1/4	25	8 5/8	8	4 1/4	26	9 1/4	8	8 1/4	27	9 3/4
7	8 3/8	24	8 1/2	8	0 3/8	25	9	8	4 3/8	26	9 5/8	8	8 3/8	27	10 1/8
7	8 1/2	24	8 7/8	8	0 1/2	25	9 1/2	8	4 1/2	26	10	8	8 1/2	27	10 5/8
7	8 5/8	24	9 1/4	8	0 5/8	25	9 7/8	8	4 5/8	26	10 3/8	8	8 5/8	27	11
7	8 3/4	24	9 5/8	8	0 3/4	25	10 1/4	8	4 3/4	26	10 3/4	8	8 3/4	27	11 3/8
7	8 7/8	24	10	8	0 7/8	25	10 5/8	8	4 7/8	26	11 1/8	8	8 7/8	27	11 3/4

TABLE VIII.,

For Angle Iron measuring $1\frac{1}{8}$ Inch thick, diagonally across the root.

FLANGE OUTSIDE.

Inside Diameter of Ring.		Length Required for Ring.		Inside Diameter of Ring.		Length Required for Ring.		Inside Diameter of Ring.		Length Required for Ring.		Inside Diameter of Ring.		Length Required for Ring.	
Ft.	In.	Ft.	In.	Ft.	In.	Ft.	In.	Ft.	In.	Ft.	In.	Ft.	In.	Ft.	In.
0	9	2	$11\frac{3}{8}$	1	1	3	$11\frac{7}{8}$	1	5	5	$0\frac{3}{8}$	1	9	6	1
0	$9\frac{1}{8}$	2	$11\frac{3}{4}$	1	$1\frac{1}{8}$	4	$0\frac{1}{4}$	1	$5\frac{1}{8}$	5	$0\frac{7}{8}$	1	$9\frac{1}{8}$	6	$1\frac{3}{8}$
0	$9\frac{1}{4}$	3	$0\frac{1}{8}$	1	$1\frac{1}{4}$	4	$0\frac{5}{8}$	1	$5\frac{1}{4}$	5	$1\frac{1}{4}$	1	$9\frac{1}{4}$	6	$1\frac{3}{4}$
0	$9\frac{3}{8}$	3	$0\frac{1}{2}$	1	$1\frac{3}{8}$	4	1	1	$5\frac{3}{8}$	5	$1\frac{5}{8}$	1	$9\frac{3}{8}$	6	$2\frac{1}{4}$
0	$9\frac{1}{2}$	3	$0\frac{7}{8}$	1	$1\frac{1}{2}$	4	$1\frac{3}{8}$	1	$5\frac{1}{2}$	5	2	1	$9\frac{1}{2}$	6	$2\frac{5}{8}$
0	$9\frac{5}{8}$	3	$1\frac{1}{4}$	1	$1\frac{5}{8}$	4	$1\frac{7}{8}$	1	$5\frac{5}{8}$	5	$2\frac{3}{8}$	1	$9\frac{5}{8}$	6	3
0	$9\frac{3}{4}$	3	$1\frac{5}{8}$	1	$1\frac{3}{4}$	4	$2\frac{1}{4}$	1	$5\frac{3}{4}$	5	$2\frac{3}{4}$	1	$9\frac{3}{4}$	6	$3\frac{3}{8}$
0	$9\frac{7}{8}$	3	2	1	$1\frac{7}{8}$	4	$2\frac{5}{8}$	1	$5\frac{7}{8}$	5	$3\frac{1}{8}$	1	$9\frac{7}{8}$	6	$3\frac{3}{4}$
0	10	3	$2\frac{1}{2}$	1	2	4	3	1	6	5	$3\frac{5}{8}$	1	10	6	$4\frac{1}{8}$
0	$10\frac{1}{8}$	3	$2\frac{7}{8}$	1	$2\frac{1}{8}$	4	$3\frac{3}{8}$	1	$6\frac{1}{8}$	5	4	1	$10\frac{1}{8}$	6	$4\frac{1}{2}$
0	$10\frac{1}{4}$	3	$3\frac{1}{4}$	1	$2\frac{1}{4}$	4	$3\frac{3}{4}$	1	$6\frac{1}{4}$	5	$4\frac{3}{8}$	1	$10\frac{1}{4}$	6	$4\frac{7}{8}$
0	$10\frac{3}{8}$	3	$3\frac{5}{8}$	1	$2\frac{3}{8}$	4	$4\frac{1}{8}$	1	$6\frac{3}{8}$	5	$4\frac{3}{4}$	1	$10\frac{3}{8}$	6	$5\frac{3}{8}$
0	$10\frac{1}{2}$	3	4	1	$2\frac{1}{2}$	4	$4\frac{1}{2}$	1	$6\frac{1}{2}$	5	$5\frac{1}{8}$	1	$10\frac{1}{2}$	6	$5\frac{3}{4}$
0	$10\frac{5}{8}$	3	$4\frac{3}{8}$	1	$2\frac{5}{8}$	4	5	1	$6\frac{5}{8}$	5	$5\frac{1}{2}$	1	$10\frac{5}{8}$	6	$6\frac{1}{8}$
0	$10\frac{3}{4}$	3	$4\frac{7}{8}$	1	$2\frac{3}{4}$	4	$5\frac{3}{8}$	1	$6\frac{3}{4}$	5	$5\frac{7}{8}$	1	$10\frac{3}{4}$	6	$6\frac{1}{2}$
0	$10\frac{7}{8}$	3	$5\frac{1}{4}$	1	$2\frac{7}{8}$	4	$5\frac{3}{4}$	1	$6\frac{7}{8}$	5	$6\frac{3}{8}$	1	$10\frac{7}{8}$	6	$6\frac{7}{8}$
0	11	3	$5\frac{5}{8}$	1	3	4	$6\frac{1}{8}$	1	7	5	$6\frac{3}{4}$	1	11	6	$7\frac{1}{4}$
0	$11\frac{1}{8}$	3	6	1	$3\frac{1}{8}$	4	$6\frac{1}{2}$	1	$7\frac{1}{8}$	5	$7\frac{1}{8}$	1	$11\frac{1}{8}$	6	$7\frac{5}{8}$
0	$11\frac{1}{4}$	3	$6\frac{3}{8}$	1	$3\frac{1}{4}$	4	7	1	$7\frac{1}{4}$	5	$7\frac{1}{2}$	1	$11\frac{1}{4}$	6	$8\frac{1}{8}$
0	$11\frac{3}{8}$	3	$6\frac{3}{4}$	1	$3\frac{3}{8}$	4	$7\frac{3}{8}$	1	$7\frac{3}{8}$	5	8	1	$11\frac{3}{8}$	6	$8\frac{1}{2}$
0	$11\frac{1}{2}$	3	$7\frac{1}{8}$	1	$3\frac{1}{2}$	4	$7\frac{3}{4}$	1	$7\frac{1}{2}$	5	$8\frac{3}{8}$	1	$11\frac{1}{2}$	6	$8\frac{7}{8}$
0	$11\frac{5}{8}$	3	$7\frac{5}{8}$	1	$3\frac{5}{8}$	4	$8\frac{1}{8}$	1	$7\frac{5}{8}$	5	$8\frac{3}{4}$	1	$11\frac{5}{8}$	6	$9\frac{1}{4}$
0	$11\frac{3}{4}$	3	8	1	$3\frac{3}{4}$	4	$8\frac{1}{2}$	1	$7\frac{3}{4}$	5	$9\frac{1}{8}$	1	$11\frac{3}{4}$	6	$9\frac{5}{8}$
0	$11\frac{7}{8}$	3	$8\frac{3}{8}$	1	$3\frac{7}{8}$	4	$8\frac{7}{8}$	1	$7\frac{7}{8}$	5	$9\frac{1}{2}$	1	$11\frac{7}{8}$	6	10
1	0	3	$8\frac{3}{4}$	1	4	4	$9\frac{1}{4}$	1	8	5	$9\frac{7}{8}$	2	0	6	$10\frac{1}{2}$
1	$0\frac{1}{8}$	3	$9\frac{1}{8}$	1	$4\frac{1}{8}$	4	$9\frac{5}{8}$	1	$8\frac{1}{8}$	5	$10\frac{1}{4}$	2	$0\frac{1}{8}$	6	$10\frac{7}{8}$
1	$0\frac{1}{4}$	3	$9\frac{1}{2}$	1	$4\frac{1}{4}$	4	$10\frac{1}{8}$	1	$8\frac{1}{4}$	5	$10\frac{5}{8}$	2	$0\frac{1}{4}$	6	$11\frac{1}{4}$
1	$0\frac{3}{8}$	3	$9\frac{7}{8}$	1	$4\frac{3}{8}$	4	$10\frac{1}{2}$	1	$8\frac{3}{8}$	5	11	2	$0\frac{3}{8}$	6	$11\frac{5}{8}$
1	$0\frac{1}{2}$	3	$10\frac{3}{8}$	1	$4\frac{1}{2}$	4	$10\frac{7}{8}$	1	$8\frac{1}{2}$	5	$11\frac{1}{2}$	2	$0\frac{1}{2}$	7	0
1	$0\frac{5}{8}$	3	$10\frac{3}{4}$	1	$4\frac{5}{8}$	4	$11\frac{1}{4}$	1	$8\frac{5}{8}$	5	$11\frac{7}{8}$	2	$0\frac{5}{8}$	7	$0\frac{3}{8}$
1	$0\frac{3}{4}$	3	$11\frac{1}{8}$	1	$4\frac{3}{4}$	4	$11\frac{5}{8}$	1	$8\frac{3}{4}$	6	$0\frac{1}{4}$	2	$0\frac{3}{4}$	7	$0\frac{3}{4}$
1	$0\frac{7}{8}$	3	$11\frac{1}{2}$	1	$4\frac{7}{8}$	5	0	1	$8\frac{7}{8}$	6	$0\frac{5}{8}$	2	$0\frac{7}{8}$	7	$1\frac{1}{8}$

For Angle Iron measuring $1\frac{1}{3}$ Inch thick, diagonally across the root.

FLANGE OUTSIDE.

INSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.		INSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.		INSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.		INSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.	
FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.
2	1	7	$1\frac{1}{2}$	2	5	8	$2\frac{1}{8}$	2	9	9	$2\frac{3}{4}$	3	1	10	$3\frac{1}{4}$
2	$1\frac{1}{8}$	7	2	2	$5\frac{1}{8}$	8	$2\frac{1}{2}$	2	$9\frac{1}{8}$	9	$3\frac{1}{8}$	3	$1\frac{1}{8}$	10	$3\frac{5}{8}$
2	$1\frac{1}{4}$	7	$2\frac{3}{8}$	2	$5\frac{1}{4}$	8	$2\frac{7}{8}$	2	$9\frac{1}{4}$	9	$3\frac{1}{2}$	3	$1\frac{1}{4}$	10	4
2	$1\frac{3}{8}$	7	$2\frac{3}{4}$	2	$5\frac{3}{8}$	8	$3\frac{3}{8}$	2	$9\frac{3}{8}$	9	$3\frac{7}{8}$	3	$1\frac{3}{8}$	10	$4\frac{1}{2}$
2	$1\frac{1}{2}$	7	$3\frac{1}{8}$	2	$5\frac{1}{2}$	8	$3\frac{3}{4}$	2	$9\frac{1}{2}$	9	$4\frac{1}{4}$	3	$1\frac{1}{2}$	10	$4\frac{7}{8}$
2	$1\frac{5}{8}$	7	$3\frac{1}{2}$	2	$5\frac{5}{8}$	8	$4\frac{1}{8}$	2	$9\frac{5}{8}$	9	$4\frac{5}{8}$	3	$1\frac{5}{8}$	10	$5\frac{1}{4}$
2	$1\frac{3}{4}$	7	$3\frac{7}{8}$	2	$5\frac{3}{4}$	8	$4\frac{1}{2}$	2	$9\frac{3}{4}$	9	5	3	$1\frac{3}{4}$	10	$5\frac{5}{8}$
2	$1\frac{7}{8}$	7	$4\frac{3}{8}$	2	$5\frac{7}{8}$	8	$4\frac{7}{8}$	2	$9\frac{7}{8}$	9	$5\frac{1}{2}$	3	$1\frac{7}{8}$	10	6
2	2	7	$4\frac{3}{4}$	2	6	8	$5\frac{1}{4}$	2	10	9	$5\frac{7}{8}$	3	2	10	$6\frac{3}{8}$
2	$2\frac{1}{8}$	7	$5\frac{1}{8}$	2	$6\frac{1}{8}$	8	$5\frac{5}{8}$	2	$10\frac{1}{8}$	9	$6\frac{1}{4}$	3	$2\frac{1}{8}$	10	$6\frac{7}{8}$
2	$2\frac{1}{4}$	7	$5\frac{1}{2}$	2	$6\frac{1}{4}$	8	6	2	$10\frac{1}{4}$	9	$6\frac{5}{8}$	3	$2\frac{1}{4}$	10	$7\frac{1}{4}$
2	$2\frac{3}{8}$	7	$5\frac{7}{8}$	2	$6\frac{3}{8}$	8	$6\frac{1}{2}$	2	$10\frac{3}{8}$	9	7	3	$2\frac{3}{8}$	10	$7\frac{5}{8}$
2	$2\frac{1}{2}$	7	$6\frac{1}{4}$	2	$6\frac{1}{2}$	8	$6\frac{7}{8}$	2	$10\frac{1}{2}$	9	$7\frac{3}{8}$	3	$2\frac{1}{2}$	10	8
2	$2\frac{5}{8}$	7	$6\frac{5}{8}$	2	$6\frac{5}{8}$	8	$7\frac{1}{4}$	2	$10\frac{5}{8}$	9	$7\frac{7}{8}$	3	$2\frac{5}{8}$	10	$8\frac{3}{8}$
2	$2\frac{3}{4}$	7	7	2	$6\frac{3}{4}$	8	$7\frac{5}{8}$	2	$10\frac{3}{4}$	9	$8\frac{1}{8}$	3	$2\frac{3}{4}$	10	$8\frac{3}{4}$
2	$2\frac{7}{8}$	7	$7\frac{1}{2}$	2	$6\frac{7}{8}$	8	8	2	$10\frac{7}{8}$	9	$8\frac{5}{8}$	3	$2\frac{7}{8}$	10	$9\frac{1}{8}$
2	3	7	$7\frac{7}{8}$	2	7	8	$8\frac{3}{8}$	2	11	9	9	3	3	10	$9\frac{1}{2}$
2	$3\frac{1}{8}$	7	$8\frac{1}{4}$	2	$7\frac{1}{8}$	8	$8\frac{7}{8}$	2	$11\frac{1}{8}$	9	$9\frac{3}{8}$	3	$3\frac{1}{8}$	10	$9\frac{7}{8}$
2	$3\frac{1}{4}$	7	$8\frac{5}{8}$	2	$7\frac{1}{4}$	8	$9\frac{1}{4}$	2	$11\frac{1}{4}$	9	$9\frac{3}{4}$	3	$3\frac{1}{4}$	10	$10\frac{3}{8}$
2	$3\frac{3}{8}$	7	9	2	$7\frac{3}{8}$	8	$9\frac{5}{8}$	2	$11\frac{3}{8}$	9	$10\frac{1}{8}$	3	$3\frac{3}{8}$	10	$10\frac{3}{4}$
2	$3\frac{1}{2}$	7	$9\frac{3}{8}$	2	$7\frac{1}{2}$	8	10	2	$11\frac{1}{2}$	9	$10\frac{1}{2}$	3	$3\frac{1}{2}$	10	$11\frac{1}{8}$
2	$3\frac{5}{8}$	7	$9\frac{3}{4}$	2	$7\frac{5}{8}$	8	$10\frac{3}{8}$	2	$11\frac{5}{8}$	9	$10\frac{7}{8}$	3	$3\frac{5}{8}$	10	$11\frac{1}{2}$
2	$3\frac{3}{4}$	7	$10\frac{1}{4}$	2	$7\frac{3}{4}$	8	$10\frac{3}{4}$	2	$11\frac{3}{4}$	9	$11\frac{3}{8}$	3	$3\frac{3}{4}$	10	$11\frac{7}{8}$
2	$3\frac{7}{8}$	7	$10\frac{5}{8}$	2	$7\frac{7}{8}$	8	$11\frac{1}{8}$	2	$11\frac{7}{8}$	9	$11\frac{3}{4}$	3	$3\frac{7}{8}$	11	$0\frac{3}{8}$
2	4	7	11	2	8	8	$11\frac{1}{2}$	3	0	10	$0\frac{1}{8}$	3	4	11	$0\frac{3}{4}$
2	$4\frac{1}{8}$	7	$11\frac{3}{8}$	2	$8\frac{1}{8}$	9	0	3	$0\frac{1}{8}$	10	$0\frac{1}{2}$	3	$4\frac{1}{8}$	11	$1\frac{1}{8}$
2	$4\frac{1}{4}$	7	$11\frac{3}{4}$	2	$8\frac{1}{4}$	9	$0\frac{3}{8}$	3	$0\frac{1}{4}$	10	$0\frac{7}{8}$	3	$4\frac{1}{4}$	11	$1\frac{1}{2}$
2	$4\frac{3}{8}$	8	$0\frac{1}{8}$	2	$8\frac{3}{8}$	9	$0\frac{3}{4}$	3	$0\frac{3}{8}$	10	$1\frac{3}{8}$	3	$4\frac{3}{8}$	11	$1\frac{7}{8}$
2	$4\frac{1}{2}$	8	$0\frac{1}{2}$	2	$8\frac{1}{2}$	9	$1\frac{1}{8}$	3	$0\frac{1}{2}$	10	$1\frac{3}{4}$	3	$4\frac{1}{2}$	11	$2\frac{1}{4}$
2	$4\frac{5}{8}$	8	1	2	$8\frac{5}{8}$	9	$1\frac{1}{2}$	3	$0\frac{5}{8}$	10	$2\frac{1}{8}$	3	$4\frac{5}{8}$	11	$2\frac{5}{8}$
2	$4\frac{3}{4}$	8	$1\frac{3}{8}$	2	$8\frac{3}{4}$	9	$1\frac{7}{8}$	3	$0\frac{3}{4}$	10	$2\frac{1}{2}$	3	$4\frac{3}{4}$	11	3
2	$4\frac{7}{8}$	8	$1\frac{3}{4}$	2	$8\frac{7}{8}$	9	$2\frac{3}{8}$	3	$0\frac{7}{8}$	10	$2\frac{7}{8}$	3	$4\frac{7}{8}$	11	$3\frac{1}{2}$

For Angle Iron measuring 1⅛ Inch thick, diagonally across the root.

FLANGE OUTSIDE.

INSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.		INSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.		INSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.		INSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.	
FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.
3	5	11	3⅞	3	9	12	4⅜	4	1	13	5	4	5	14	5½
3	5⅛	11	4¼	3	9⅛	12	4¾	4	1⅛	13	5⅜	4	5⅛	14	5⅞
3	5¼	11	4⅝	3	9¼	12	5¼	4	1¼	13	5¾	4	5¼	14	6⅜
3	5⅜	11	5	3	9⅜	12	5⅝	4	1⅜	13	6⅛	4	5⅜	14	6¾
3	5½	11	5⅜	3	9½	12	6	4	1½	13	6½	4	5½	14	7⅛
3	5⅝	11	5¾	3	9⅝	12	6⅜	4	1⅝	13	7	4	5⅝	14	7½
3	5¾	11	6¼	3	9¾	12	6¾	4	1¾	13	7⅜	4	5¾	14	7⅞
3	5⅞	11	6⅝	3	9⅞	12	7⅛	4	1⅞	13	7¾	4	5⅞	14	8¼
3	6	11	7	3	10	12	7½	4	2	13	8⅛	4	6	14	8¾
3	6⅛	11	7⅜	3	10⅛	12	7⅞	4	2⅛	13	8½	4	6⅛	14	9⅛
3	6¼	11	7¾	3	10¼	12	8⅜	4	2¼	13	8⅞	4	6¼	14	9½
3	6⅜	11	8⅛	3	10⅜	12	8¾	4	2⅜	13	9¼	4	6⅜	14	9⅞
3	6½	11	8½	3	10½	12	9⅛	4	2½	13	9⅝	4	6½	14	10¼
3	6⅝	11	8⅞	3	10⅝	12	9½	4	2⅝	13	10⅛	4	6⅝	14	10⅝
3	6¾	11	9⅜	3	10¾	12	9⅞	4	2¾	13	10½	4	6¾	14	11
3	6⅞	11	9¾	3	10⅞	12	10⅜	4	2⅞	13	10⅞	4	6⅞	14	11½
3	7	11	10⅛	3	11	12	10¾	4	3	13	11¼	4	7	14	11⅞
3	7⅛	11	10½	3	11⅛	12	11⅛	4	3⅛	13	11⅝	4	7⅛	15	0¼
3	7¼	11	10⅞	3	11¼	12	11½	4	3¼	14	0	4	7¼	15	0⅝
3	7⅜	11	11¼	3	11⅜	12	11⅞	4	3⅜	14	0⅜	4	7⅜	15	1
3	7½	11	11⅝	3	11½	13	0¼	4	3½	14	0⅞	4	7½	15	1⅜
3	7⅝	12	0⅛	3	11⅝	13	0⅝	4	3⅝	14	1¼	4	7⅝	15	1⅞
3	7¾	12	0½	3	11¾	13	1	4	3¾	14	1⅝	4	7¾	15	2¼
3	7⅞	12	0⅞	3	11⅞	13	1½	4	3⅞	14	2	4	7⅞	15	2⅝
3	8	12	1¼	4	0	13	1⅞	4	4	14	2⅜	4	8	15	3
3	8⅛	12	1⅝	4	0⅛	13	2¼	4	4⅛	14	2¾	4	8⅛	15	3⅜
3	8¼	12	2	4	0¼	13	2⅝	4	4¼	14	3⅛	4	8¼	15	3¾
3	8⅜	12	2⅜	4	0⅜	13	3	4	4⅜	14	3½	4	8⅜	15	4⅛
3	8½	12	2⅞	4	0½	13	3⅜	4	4½	14	4	4	8½	15	4½
3	8⅝	12	3¼	4	0⅝	13	3¾	4	4⅝	14	4⅜	4	8⅝	15	4⅞
3	8¾	12	3⅝	4	0¾	13	4¼	4	4¾	14	4¾	4	8¾	15	5⅜
3	8⅞	12	4	4	0⅞	13	4⅝	4	4⅞	14	5⅛	4	8⅞	15	5¾

For Angle Iron measuring $1\frac{1}{8}$ Inch thick, diagonally across the root.

FLANGE OUTSIDE.

INSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.		INSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.		INSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.		INSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.	
FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.
4	9	15	$6\frac{1}{8}$	5	1	16	$6\frac{5}{8}$	5	5	17	$7\frac{1}{4}$	5	9	18	$7\frac{7}{8}$
4	$9\frac{1}{8}$	15	$6\frac{1}{2}$	5	$1\frac{1}{8}$	16	7	5	$5\frac{1}{8}$	17	$7\frac{5}{8}$	5	$9\frac{1}{8}$	18	$8\frac{1}{4}$
4	$9\frac{1}{4}$	15	$6\frac{7}{8}$	5	$1\frac{1}{4}$	16	$7\frac{1}{2}$	5	$5\frac{1}{4}$	17	8	5	$9\frac{1}{4}$	18	$8\frac{5}{8}$
4	$9\frac{3}{8}$	15	$7\frac{1}{4}$	5	$1\frac{3}{8}$	16	$7\frac{7}{8}$	5	$5\frac{3}{8}$	17	$8\frac{3}{8}$	5	$9\frac{3}{8}$	18	9
4	$9\frac{1}{2}$	15	$7\frac{3}{4}$	5	$1\frac{1}{2}$	16	$8\frac{1}{4}$	5	$5\frac{1}{2}$	17	$8\frac{7}{8}$	5	$9\frac{1}{2}$	18	$9\frac{3}{8}$
4	$9\frac{5}{8}$	15	$8\frac{1}{8}$	5	$1\frac{5}{8}$	16	$8\frac{5}{8}$	5	$5\frac{5}{8}$	17	$9\frac{1}{4}$	5	$9\frac{5}{8}$	18	$9\frac{3}{4}$
4	$9\frac{3}{4}$	15	$8\frac{1}{2}$	5	$1\frac{3}{4}$	16	9	5	$5\frac{3}{4}$	17	$9\frac{5}{8}$	5	$9\frac{3}{4}$	18	$10\frac{1}{8}$
4	$9\frac{7}{8}$	15	$8\frac{7}{8}$	5	$1\frac{7}{8}$	16	$9\frac{3}{8}$	5	$5\frac{7}{8}$	17	10	5	$9\frac{7}{8}$	18	$10\frac{1}{2}$
4	10	15	$9\frac{1}{4}$	5	2	16	$9\frac{7}{8}$	5	6	17	$10\frac{3}{8}$	5	10	18	11
4	$10\frac{1}{8}$	15	$9\frac{5}{8}$	5	$2\frac{1}{8}$	16	$10\frac{1}{4}$	5	$6\frac{1}{8}$	17	$10\frac{3}{4}$	5	$10\frac{1}{8}$	18	$11\frac{3}{8}$
4	$10\frac{1}{4}$	15	10	5	$2\frac{1}{4}$	16	$10\frac{5}{8}$	5	$6\frac{1}{4}$	17	$11\frac{1}{8}$	5	$10\frac{1}{4}$	18	$11\frac{3}{4}$
4	$10\frac{3}{8}$	15	$10\frac{3}{8}$	5	$2\frac{3}{8}$	16	11	5	$6\frac{3}{8}$	17	$11\frac{1}{2}$	5	$10\frac{3}{8}$	19	$0\frac{1}{8}$
4	$10\frac{1}{2}$	15	$10\frac{7}{8}$	5	$2\frac{1}{2}$	16	$11\frac{3}{8}$	5	$6\frac{1}{2}$	18	0	5	$10\frac{1}{2}$	19	$0\frac{1}{2}$
4	$10\frac{5}{8}$	15	$11\frac{1}{4}$	5	$2\frac{5}{8}$	16	$11\frac{3}{4}$	5	$6\frac{5}{8}$	18	$0\frac{3}{8}$	5	$10\frac{5}{8}$	19	$0\frac{7}{8}$
4	$10\frac{3}{4}$	15	$11\frac{5}{8}$	5	$2\frac{3}{4}$	17	$0\frac{1}{8}$	5	$6\frac{3}{4}$	18	$0\frac{3}{4}$	5	$10\frac{3}{4}$	19	$1\frac{3}{8}$
4	$10\frac{7}{8}$	16	0	5	$2\frac{7}{8}$	17	$0\frac{5}{8}$	5	$6\frac{7}{8}$	18	$1\frac{1}{8}$	5	$10\frac{7}{8}$	19	$1\frac{3}{4}$
4	11	16	$0\frac{3}{8}$	5	3	17	1	5	7	18	$1\frac{1}{2}$	5	11	19	$2\frac{1}{8}$
4	$11\frac{1}{8}$	16	$0\frac{3}{4}$	5	$3\frac{1}{8}$	17	$1\frac{3}{8}$	5	$7\frac{1}{8}$	18	$1\frac{7}{8}$	5	$11\frac{1}{8}$	19	$2\frac{1}{4}$
4	$11\frac{1}{4}$	16	$1\frac{1}{8}$	5	$3\frac{1}{4}$	17	$1\frac{3}{4}$	5	$7\frac{1}{4}$	18	$2\frac{3}{8}$	5	$11\frac{1}{4}$	19	$2\frac{7}{8}$
4	$11\frac{3}{8}$	16	$1\frac{5}{8}$	5	$3\frac{3}{8}$	17	$2\frac{1}{8}$	5	$7\frac{3}{8}$	18	$2\frac{3}{4}$	5	$11\frac{3}{8}$	19	$3\frac{1}{4}$
4	$11\frac{1}{2}$	16	2	5	$3\frac{1}{2}$	17	$2\frac{1}{2}$	5	$7\frac{1}{2}$	18	$3\frac{1}{8}$	5	$11\frac{1}{2}$	19	$3\frac{5}{8}$
4	$11\frac{5}{8}$	16	$2\frac{3}{8}$	5	$3\frac{5}{8}$	17	$2\frac{7}{8}$	5	$7\frac{5}{8}$	18	$3\frac{1}{2}$	5	$11\frac{5}{8}$	19	4
4	$11\frac{3}{4}$	16	$2\frac{3}{4}$	5	$3\frac{3}{4}$	17	$3\frac{3}{8}$	5	$7\frac{3}{4}$	18	$3\frac{7}{8}$	5	$11\frac{3}{4}$	19	$4\frac{1}{2}$
4	$11\frac{7}{8}$	16	$3\frac{1}{8}$	5	$3\frac{7}{8}$	17	$3\frac{3}{4}$	5	$7\frac{7}{8}$	18	$4\frac{1}{4}$	5	$11\frac{7}{8}$	19	$4\frac{7}{8}$
5	0	16	$3\frac{1}{2}$	5	4	17	$4\frac{1}{8}$	5	8	18	$4\frac{5}{8}$	6	0	19	$5\frac{1}{4}$
5	$0\frac{1}{8}$	16	$3\frac{7}{8}$	5	$4\frac{1}{8}$	17	$4\frac{1}{2}$	5	$8\frac{1}{8}$	18	5	6	$0\frac{1}{8}$	19	$5\frac{5}{8}$
5	$0\frac{1}{4}$	16	$4\frac{3}{8}$	5	$4\frac{1}{4}$	17	$4\frac{7}{8}$	5	$8\frac{1}{4}$	18	$5\frac{1}{2}$	6	$0\frac{1}{4}$	19	6
5	$0\frac{3}{8}$	16	$4\frac{3}{4}$	5	$4\frac{3}{8}$	17	$5\frac{1}{4}$	5	$8\frac{3}{8}$	18	$5\frac{7}{8}$	6	$0\frac{3}{8}$	19	$6\frac{3}{8}$
5	$0\frac{1}{2}$	16	$5\frac{1}{8}$	5	$4\frac{1}{2}$	17	$5\frac{5}{8}$	5	$8\frac{1}{2}$	18	$6\frac{1}{4}$	6	$0\frac{1}{2}$	19	$6\frac{7}{8}$
5	$0\frac{5}{8}$	16	$5\frac{1}{2}$	5	$4\frac{5}{8}$	17	6	5	$8\frac{5}{8}$	18	$6\frac{5}{8}$	6	$0\frac{5}{8}$	19	$7\frac{1}{4}$
5	$0\frac{3}{4}$	16	$5\frac{7}{8}$	5	$4\frac{3}{4}$	17	$6\frac{1}{2}$	5	$8\frac{3}{4}$	18	7	6	$0\frac{3}{4}$	19	$7\frac{5}{8}$
5	$0\frac{7}{8}$	16	$6\frac{1}{4}$	5	$4\frac{7}{8}$	17	$6\frac{7}{8}$	5	$8\frac{7}{8}$	18	$7\frac{3}{8}$	6	$0\frac{7}{8}$	19	8

For Angle Iron measuring $1\frac{1}{8}$ Inch thick, diagonally across the root.

FLANGE OUTSIDE.

INSIDE DIAMETER OF RING		LENGTH REQUIRED FOR RING.		INSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.		INSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.		INSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.	
FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.
6	1	19	$8\frac{3}{8}$	6	5	20	9	6	9	21	$9\frac{1}{2}$	7	1	22	$10\frac{1}{8}$
6	$1\frac{1}{8}$	19	$8\frac{3}{4}$	6	$5\frac{1}{8}$	20	$9\frac{3}{8}$	6	$9\frac{1}{8}$	21	$9\frac{7}{8}$	7	$1\frac{1}{8}$	22	$10\frac{1}{2}$
6	$1\frac{1}{4}$	19	$9\frac{1}{8}$	6	$5\frac{1}{4}$	20	$9\frac{3}{4}$	6	$9\frac{1}{4}$	21	$10\frac{3}{8}$	7	$1\frac{1}{4}$	22	$10\frac{7}{8}$
6	$1\frac{3}{8}$	19	$9\frac{5}{8}$	6	$5\frac{3}{8}$	20	$10\frac{1}{8}$	6	$9\frac{3}{8}$	21	$10\frac{3}{4}$	7	$1\frac{3}{8}$	22	$11\frac{1}{4}$
6	$1\frac{1}{2}$	19	10	6	$5\frac{1}{2}$	20	$10\frac{1}{2}$	6	9	21	$11\frac{1}{8}$	7	$1\frac{1}{2}$	22	$11\frac{5}{8}$
6	$1\frac{5}{8}$	19	$10\frac{3}{8}$	6	$5\frac{5}{8}$	20	$10\frac{7}{8}$	6	$9\frac{3}{8}$	21	$11\frac{1}{2}$	7	$1\frac{5}{8}$	23	0
6	$1\frac{3}{4}$	19	$10\frac{3}{4}$	6	$5\frac{3}{4}$	20	$11\frac{3}{8}$	6	$9\frac{3}{4}$	21	$11\frac{7}{8}$	7	$1\frac{3}{4}$	23	$0\frac{1}{2}$
6	$1\frac{7}{8}$	19	$11\frac{1}{8}$	6	$5\frac{7}{8}$	20	$11\frac{3}{4}$	6	$9\frac{7}{8}$	22	$0\frac{1}{4}$	7	$1\frac{7}{8}$	23	$0\frac{7}{8}$
6	2	19	$11\frac{1}{2}$	6	6	21	$0\frac{1}{8}$	6	10	22	$0\frac{5}{8}$	7	2	23	$1\frac{1}{4}$
6	$2\frac{1}{8}$	19	$11\frac{7}{8}$	6	$6\frac{1}{8}$	21	$0\frac{1}{2}$	6	$10\frac{1}{8}$	22	1	7	$2\frac{1}{8}$	23	$1\frac{5}{8}$
6	$2\frac{1}{4}$	20	$0\frac{3}{8}$	6	$6\frac{1}{4}$	21	$0\frac{7}{8}$	6	$10\frac{1}{4}$	22	$1\frac{1}{2}$	7	$2\frac{1}{4}$	23	2
6	$2\frac{3}{8}$	20	$0\frac{3}{4}$	6	$6\frac{3}{8}$	21	$1\frac{1}{4}$	6	$10\frac{3}{8}$	22	$1\frac{5}{8}$	7	$2\frac{3}{8}$	23	$2\frac{3}{8}$
6	$2\frac{1}{2}$	20	$1\frac{1}{8}$	6	$6\frac{1}{2}$	21	$1\frac{5}{8}$	6	$10\frac{1}{2}$	22	$2\frac{1}{4}$	7	$2\frac{1}{2}$	23	$2\frac{3}{4}$
6	$2\frac{5}{8}$	20	$1\frac{1}{2}$	6	$6\frac{5}{8}$	21	2	6	$10\frac{5}{8}$	22	$2\frac{5}{8}$	7	$2\frac{5}{8}$	23	$3\frac{1}{4}$
6	$2\frac{3}{4}$	20	$1\frac{7}{8}$	6	$6\frac{3}{4}$	21	$2\frac{1}{2}$	6	$10\frac{3}{4}$	22	3	7	$2\frac{3}{4}$	23	$3\frac{5}{8}$
6	$2\frac{7}{8}$	20	$2\frac{1}{4}$	6	$6\frac{7}{8}$	21	$2\frac{7}{8}$	6	$10\frac{7}{8}$	22	$3\frac{3}{8}$	7	$2\frac{7}{8}$	23	4
6	3	20	$2\frac{5}{8}$	6	7	21	$3\frac{1}{4}$	6	11	22	$3\frac{7}{8}$	7	3	23	$4\frac{3}{8}$
6	$3\frac{1}{8}$	20	3	6	$7\frac{1}{8}$	21	$3\frac{5}{8}$	6	$11\frac{1}{8}$	22	$4\frac{1}{4}$	7	$3\frac{1}{8}$	23	$4\frac{3}{4}$
6	$3\frac{1}{4}$	20	$3\frac{1}{2}$	6	$7\frac{1}{4}$	21	4	6	$11\frac{1}{4}$	22	$4\frac{5}{8}$	7	$3\frac{1}{4}$	23	$5\frac{1}{8}$
6	$3\frac{3}{8}$	20	$3\frac{7}{8}$	6	$7\frac{3}{8}$	21	$4\frac{3}{8}$	6	$11\frac{3}{8}$	22	5	7	$3\frac{3}{8}$	23	$5\frac{1}{2}$
6	$3\frac{1}{2}$	20	$4\frac{1}{4}$	6	$7\frac{1}{2}$	21	$4\frac{3}{4}$	6	$11\frac{1}{2}$	22	$5\frac{3}{8}$	7	$3\frac{1}{2}$	23	6
6	$3\frac{5}{8}$	20	$4\frac{5}{8}$	6	$7\frac{5}{8}$	21	$5\frac{1}{8}$	6	$11\frac{5}{8}$	22	$5\frac{3}{4}$	7	$3\frac{5}{8}$	23	$6\frac{3}{8}$
6	$3\frac{3}{4}$	20	5	6	$7\frac{3}{4}$	21	$5\frac{1}{2}$	6	$11\frac{3}{4}$	22	$6\frac{1}{8}$	7	$3\frac{3}{4}$	23	$6\frac{3}{4}$
6	$3\frac{7}{8}$	20	$5\frac{3}{8}$	6	$7\frac{7}{8}$	21	6	6	$11\frac{7}{8}$	22	$6\frac{1}{2}$	7	$3\frac{7}{8}$	23	$7\frac{1}{8}$
6	4	20	$5\frac{7}{8}$	6	8	21	$6\frac{3}{8}$	7	0	22	7	7	4	23	$7\frac{1}{2}$
6	$4\frac{1}{8}$	20	$6\frac{1}{4}$	6	$8\frac{1}{8}$	21	$6\frac{3}{4}$	7	$0\frac{1}{8}$	22	$7\frac{3}{8}$	7	$4\frac{1}{8}$	23	$7\frac{7}{8}$
6	$4\frac{1}{4}$	20	$6\frac{5}{8}$	6	$8\frac{1}{4}$	21	$7\frac{1}{8}$	7	$0\frac{1}{4}$	22	$7\frac{3}{4}$	7	$4\frac{1}{4}$	23	$8\frac{1}{4}$
6	$4\frac{3}{8}$	20	7	6	$8\frac{3}{8}$	21	$7\frac{5}{8}$	7	$0\frac{3}{8}$	22	$8\frac{1}{8}$	7	$4\frac{3}{8}$	23	$8\frac{3}{4}$
6	$4\frac{1}{2}$	20	$7\frac{3}{8}$	6	$8\frac{1}{2}$	21	8	7	$0\frac{1}{2}$	22	$8\frac{1}{2}$	7	$4\frac{1}{2}$	23	$9\frac{1}{8}$
6	$4\frac{5}{8}$	20	$7\frac{3}{4}$	6	$8\frac{5}{8}$	21	$8\frac{3}{8}$	7	$0\frac{5}{8}$	22	$8\frac{7}{8}$	7	$4\frac{5}{8}$	23	$9\frac{1}{2}$
6	$4\frac{3}{4}$	20	$8\frac{1}{8}$	6	$8\frac{3}{4}$	21	$8\frac{3}{4}$	7	$0\frac{3}{4}$	22	$9\frac{1}{2}$	7	$4\frac{3}{4}$	23	$9\frac{7}{8}$
6	$4\frac{7}{8}$	20	$8\frac{1}{2}$	6	$8\frac{7}{8}$	21	$9\frac{1}{8}$	7	$0\frac{7}{8}$	22	$9\frac{3}{4}$	7	$4\frac{7}{8}$	23	$10\frac{1}{4}$

For Angle Iron measuring $1\frac{7}{8}$ Inch thick, diagonally across the root.

FLANGE OUTSIDE.

INSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.		INSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.		INSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.		INSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.	
FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.
7	5	23	$10\frac{5}{8}$	7	9	24	$11\frac{1}{4}$	8	1	25	$11\frac{3}{4}$	8	5	27	$0\frac{3}{8}$
7	$5\frac{1}{8}$	23	11	7	$9\frac{1}{8}$	24	$11\frac{5}{8}$	8	$1\frac{1}{8}$	26	$0\frac{1}{8}$	8	$5\frac{1}{8}$	27	$0\frac{3}{4}$
7	$5\frac{1}{4}$	23	$11\frac{1}{2}$	7	$9\frac{1}{4}$	25	0	8	$1\frac{1}{4}$	26	$0\frac{5}{8}$	8	$5\frac{1}{4}$	27	$1\frac{1}{8}$
7	$5\frac{3}{8}$	23	$11\frac{7}{8}$	7	$9\frac{3}{8}$	25	$0\frac{3}{8}$	8	$1\frac{3}{8}$	26	1	8	$5\frac{3}{8}$	27	$1\frac{1}{2}$
7	$5\frac{1}{2}$	24	$0\frac{1}{4}$	7	$9\frac{1}{2}$	25	$0\frac{3}{4}$	8	$1\frac{1}{2}$	26	$1\frac{3}{8}$	8	$5\frac{1}{2}$	27	$1\frac{7}{8}$
7	$5\frac{5}{8}$	24	$0\frac{5}{8}$	7	$9\frac{5}{8}$	25	$1\frac{1}{4}$	8	$1\frac{5}{8}$	26	$1\frac{3}{4}$	8	$5\frac{5}{8}$	27	$2\frac{3}{8}$
7	$5\frac{3}{4}$	24	1	7	$9\frac{3}{4}$	25	$1\frac{5}{8}$	8	$1\frac{3}{4}$	26	$2\frac{1}{8}$	8	$5\frac{3}{4}$	27	$2\frac{3}{4}$
7	$5\frac{7}{8}$	24	$1\frac{3}{8}$	7	$9\frac{7}{8}$	25	2	8	$1\frac{7}{8}$	26	$2\frac{1}{2}$	8	$5\frac{7}{8}$	27	$3\frac{1}{8}$
7	6	24	$1\frac{3}{4}$	7	10	25	$2\frac{3}{8}$	8	2	26	$2\frac{7}{8}$	8	6	27	$3\frac{1}{2}$
7	$6\frac{1}{8}$	24	$2\frac{1}{4}$	7	$10\frac{1}{8}$	25	$2\frac{3}{4}$	8	$2\frac{1}{8}$	26	$3\frac{3}{8}$	8	$6\frac{1}{8}$	27	$3\frac{7}{8}$
7	$6\frac{1}{4}$	24	$2\frac{5}{8}$	7	$10\frac{1}{4}$	25	$3\frac{1}{8}$	8	$2\frac{1}{4}$	26	$3\frac{3}{4}$	8	$6\frac{1}{4}$	27	$4\frac{1}{4}$
7	$6\frac{3}{8}$	24	3	7	$10\frac{3}{8}$	25	$3\frac{1}{2}$	8	$2\frac{3}{8}$	26	$4\frac{1}{8}$	8	$6\frac{3}{8}$	27	$4\frac{5}{8}$
7	$6\frac{1}{2}$	24	$3\frac{3}{8}$	7	$10\frac{1}{2}$	25	$3\frac{7}{8}$	8	$2\frac{1}{2}$	26	$4\frac{1}{2}$	8	$6\frac{1}{2}$	27	5
7	$6\frac{5}{8}$	24	$3\frac{3}{4}$	7	$10\frac{5}{8}$	25	$4\frac{3}{8}$	8	$2\frac{5}{8}$	26	$4\frac{7}{8}$	8	$6\frac{5}{8}$	27	$5\frac{1}{2}$
7	$6\frac{3}{4}$	24	$4\frac{1}{8}$	7	$10\frac{3}{4}$	25	$4\frac{3}{4}$	8	$2\frac{3}{4}$	26	$5\frac{1}{4}$	8	$6\frac{3}{4}$	27	$5\frac{7}{8}$
7	$6\frac{7}{8}$	24	$4\frac{1}{2}$	7	$10\frac{7}{8}$	25	$5\frac{1}{8}$	8	$2\frac{7}{8}$	26	$5\frac{5}{8}$	8	$6\frac{7}{8}$	27	$6\frac{1}{4}$
7	7	24	$4\frac{7}{8}$	7	11	25	$5\frac{1}{2}$	8	3	26	6	8	7	27	$6\frac{5}{8}$
7	$7\frac{1}{8}$	24	$5\frac{3}{8}$	7	$11\frac{1}{8}$	25	$5\frac{7}{8}$	8	$3\frac{1}{8}$	26	$6\frac{1}{2}$	8	$7\frac{1}{8}$	27	7
7	$7\frac{1}{4}$	24	$5\frac{3}{4}$	7	$11\frac{1}{4}$	25	$6\frac{1}{4}$	8	$3\frac{1}{4}$	26	$6\frac{7}{8}$	8	$7\frac{1}{4}$	27	$7\frac{3}{8}$
7	$7\frac{3}{8}$	24	$6\frac{1}{8}$	7	$11\frac{3}{8}$	25	$6\frac{5}{8}$	8	$3\frac{3}{8}$	26	$7\frac{1}{4}$	8	$7\frac{3}{8}$	27	$7\frac{7}{8}$
7	$7\frac{1}{2}$	24	$6\frac{1}{2}$	7	$11\frac{1}{2}$	25	7	8	$3\frac{1}{2}$	26	$7\frac{5}{8}$	8	$7\frac{1}{2}$	27	$8\frac{1}{4}$
7	$7\frac{5}{8}$	24	$6\frac{7}{8}$	7	$11\frac{5}{8}$	25	$7\frac{1}{2}$	8	$3\frac{5}{8}$	26	8	8	$7\frac{5}{8}$	27	$8\frac{5}{8}$
7	$7\frac{3}{4}$	24	$7\frac{1}{8}$	7	$11\frac{3}{4}$	25	$7\frac{7}{8}$	8	$3\frac{3}{4}$	26	$8\frac{3}{8}$	8	$7\frac{3}{4}$	27	9
7	$7\frac{7}{8}$	24	$7\frac{5}{8}$	7	$11\frac{7}{8}$	25	$8\frac{1}{4}$	8	$3\frac{7}{8}$	26	$8\frac{7}{8}$	8	$7\frac{7}{8}$	27	$9\frac{3}{8}$
7	8	24	8	8	0	25	$8\frac{5}{8}$	8	4	26	$9\frac{1}{4}$	8	8	27	$9\frac{3}{4}$
7	$8\frac{1}{8}$	24	$8\frac{1}{2}$	8	$0\frac{1}{8}$	25	9	8	$4\frac{1}{8}$	26	$9\frac{5}{8}$	8	$8\frac{1}{8}$	27	$10\frac{1}{8}$
7	$8\frac{1}{4}$	24	$8\frac{7}{8}$	8	$0\frac{1}{4}$	25	$9\frac{1}{2}$	8	$4\frac{1}{4}$	26	10	8	$8\frac{1}{4}$	27	$10\frac{5}{8}$
7	$8\frac{3}{8}$	24	$9\frac{1}{4}$	8	$0\frac{3}{8}$	25	$9\frac{7}{8}$	8	$4\frac{3}{8}$	26	$10\frac{3}{8}$	8	$8\frac{3}{8}$	27	11
7	$8\frac{1}{2}$	24	$9\frac{5}{8}$	8	$0\frac{1}{2}$	25	$10\frac{1}{4}$	8	$4\frac{1}{2}$	26	$10\frac{3}{4}$	8	$8\frac{1}{2}$	27	$11\frac{3}{8}$
7	$8\frac{5}{8}$	24	10	8	$0\frac{5}{8}$	25	$10\frac{5}{8}$	8	$4\frac{5}{8}$	26	$11\frac{1}{8}$	8	$8\frac{5}{8}$	27	$11\frac{3}{4}$
7	$8\frac{3}{4}$	24	$10\frac{1}{2}$	8	$0\frac{3}{4}$	25	11	8	$4\frac{3}{4}$	26	$11\frac{1}{2}$	8	$8\frac{3}{4}$	28	$0\frac{1}{8}$
7	$8\frac{7}{8}$	24	$10\frac{7}{8}$	8	$0\frac{7}{8}$	25	$11\frac{3}{8}$	8	$4\frac{7}{8}$	27	0	8	$8\frac{7}{8}$	28	$0\frac{1}{2}$

TABLE IX.,

For Angle Iron measuring $1\frac{1}{4}$ Inch thick, diagonally across the root.

FLANGE OUTSIDE.

Inside Diameter of Ring.		Length Required for Ring.		Inside Diameter of Ring.		Length Required for Ring.		Inside Diameter of Ring.		Length Required for Ring.		Inside Diameter of Ring.		Length Required for Ring.	
Ft.	In.	Ft.	In.	Ft.	In.	Ft.	In.	Ft.	In.	Ft.	In.	Ft.	In.	Ft.	In.
0	9	3	$0\frac{1}{8}$	1	1	4	$0\frac{5}{8}$	1	5	5	$1\frac{1}{4}$	1	9	6	$1\frac{3}{4}$
0	$9\frac{1}{8}$	3	$0\frac{1}{2}$	1	$1\frac{1}{8}$	4	1	1	$5\frac{1}{8}$	5	$1\frac{5}{8}$	1	$9\frac{1}{8}$	6	$2\frac{1}{4}$
0	$9\frac{1}{4}$	3	$0\frac{7}{8}$	1	$1\frac{1}{4}$	4	$1\frac{3}{8}$	1	$5\frac{1}{4}$	5	2	1	$9\frac{1}{4}$	6	$2\frac{5}{8}$
0	$9\frac{3}{8}$	3	$1\frac{1}{4}$	1	$1\frac{3}{8}$	4	$1\frac{7}{8}$	1	$5\frac{3}{8}$	5	$2\frac{3}{8}$	1	$9\frac{3}{8}$	6	3
0	$9\frac{1}{2}$	3	$1\frac{5}{8}$	1	$1\frac{1}{2}$	4	$2\frac{1}{4}$	1	$5\frac{1}{2}$	5	$2\frac{3}{4}$	1	$9\frac{1}{2}$	6	$3\frac{3}{8}$
0	$9\frac{5}{8}$	3	2	1	$1\frac{5}{8}$	4	$2\frac{5}{8}$	1	$5\frac{5}{8}$	5	$3\frac{1}{8}$	1	$9\frac{5}{8}$	6	$3\frac{3}{4}$
0	$9\frac{3}{4}$	3	$2\frac{1}{2}$	1	$1\frac{3}{4}$	4	3	1	$5\frac{3}{4}$	5	$3\frac{5}{8}$	1	$9\frac{3}{4}$	6	$4\frac{1}{8}$
0	$9\frac{7}{8}$	3	$2\frac{7}{8}$	1	$1\frac{7}{8}$	4	$3\frac{3}{8}$	1	$5\frac{7}{8}$	5	4	1	$9\frac{7}{8}$	6	$4\frac{1}{2}$
0	10	3	$3\frac{1}{4}$	1	2	4	$3\frac{3}{4}$	1	6	5	$4\frac{3}{8}$	1	10	6	$4\frac{7}{8}$
0	$10\frac{1}{8}$	3	$3\frac{5}{8}$	1	$2\frac{1}{8}$	4	$4\frac{1}{8}$	1	$6\frac{1}{8}$	5	$4\frac{3}{4}$	1	$10\frac{1}{8}$	6	$5\frac{3}{8}$
0	$10\frac{1}{4}$	3	4	1	$2\frac{1}{4}$	4	$4\frac{1}{2}$	1	$6\frac{1}{4}$	5	$5\frac{1}{8}$	1	$10\frac{1}{4}$	6	$5\frac{3}{4}$
0	$10\frac{3}{8}$	3	$4\frac{3}{8}$	1	$2\frac{3}{8}$	4	5	1	$6\frac{3}{8}$	5	$5\frac{1}{2}$	1	$10\frac{3}{8}$	6	$6\frac{1}{8}$
0	$10\frac{1}{2}$	3	$4\frac{7}{8}$	1	$2\frac{1}{2}$	4	$5\frac{3}{8}$	1	$6\frac{1}{2}$	5	$5\frac{7}{8}$	1	$10\frac{1}{2}$	6	$6\frac{1}{2}$
0	$10\frac{5}{8}$	3	$5\frac{1}{4}$	1	$2\frac{5}{8}$	4	$5\frac{3}{4}$	1	$6\frac{5}{8}$	5	$6\frac{3}{8}$	1	$10\frac{5}{8}$	6	$6\frac{7}{8}$
0	$10\frac{3}{4}$	3	$5\frac{5}{8}$	1	$2\frac{3}{4}$	4	$6\frac{1}{8}$	1	$6\frac{3}{4}$	5	$6\frac{3}{4}$	1	$10\frac{3}{4}$	6	$7\frac{1}{4}$
0	$10\frac{7}{8}$	3	6	1	$2\frac{7}{8}$	4	$6\frac{1}{2}$	1	$6\frac{7}{8}$	5	$7\frac{1}{8}$	1	$10\frac{7}{8}$	6	$7\frac{5}{8}$
0	11	3	$6\frac{3}{8}$	1	3	4	7	1	7	5	$7\frac{1}{2}$	1	11	6	$8\frac{1}{8}$
0	$11\frac{1}{8}$	3	$6\frac{3}{4}$	1	$3\frac{1}{8}$	4	$7\frac{3}{8}$	1	$7\frac{1}{8}$	5	8	1	$11\frac{1}{8}$	6	$8\frac{1}{2}$
0	$11\frac{1}{4}$	3	$7\frac{1}{8}$	1	$3\frac{1}{4}$	4	$7\frac{3}{4}$	1	$7\frac{1}{4}$	5	$8\frac{3}{8}$	1	$11\frac{1}{4}$	6	$8\frac{7}{8}$
0	$11\frac{3}{8}$	3	$7\frac{5}{8}$	1	$3\frac{3}{8}$	4	$8\frac{1}{8}$	1	$7\frac{3}{8}$	5	$8\frac{3}{4}$	1	$11\frac{3}{8}$	6	$9\frac{1}{4}$
0	$11\frac{1}{2}$	3	8	1	$3\frac{1}{2}$	4	$8\frac{1}{2}$	1	$7\frac{1}{2}$	5	$9\frac{1}{8}$	1	$11\frac{1}{2}$	6	$9\frac{5}{8}$
0	$11\frac{5}{8}$	3	$8\frac{3}{8}$	1	$3\frac{5}{8}$	4	$8\frac{7}{8}$	1	$7\frac{5}{8}$	5	$9\frac{1}{2}$	1	$11\frac{5}{8}$	6	10
0	$11\frac{3}{4}$	3	$8\frac{3}{4}$	1	$3\frac{3}{4}$	4	$9\frac{1}{4}$	1	$7\frac{3}{4}$	5	$9\frac{7}{8}$	1	$11\frac{3}{4}$	6	$10\frac{1}{8}$
0	$11\frac{7}{8}$	3	$9\frac{1}{8}$	1	$3\frac{7}{8}$	4	$9\frac{5}{8}$	1	$7\frac{7}{8}$	5	$10\frac{1}{4}$	1	$11\frac{7}{8}$	6	$10\frac{7}{8}$
1	0	3	$9\frac{1}{2}$	1	4	4	$10\frac{1}{8}$	1	8	5	$10\frac{5}{8}$	2	0	6	$11\frac{1}{4}$
1	$0\frac{1}{8}$	3	$9\frac{7}{8}$	1	$4\frac{1}{8}$	4	$10\frac{1}{2}$	1	$8\frac{1}{8}$	5	11	2	$0\frac{1}{8}$	6	$11\frac{5}{8}$
1	$0\frac{1}{4}$	3	$10\frac{3}{8}$	1	$4\frac{1}{4}$	4	$10\frac{7}{8}$	1	$8\frac{1}{4}$	5	$11\frac{1}{2}$	2	$0\frac{1}{4}$	7	0
1	$0\frac{3}{8}$	3	$10\frac{3}{4}$	1	$4\frac{3}{8}$	4	$11\frac{1}{4}$	1	$8\frac{3}{8}$	5	$11\frac{7}{8}$	2	$0\frac{3}{8}$	7	$0\frac{3}{8}$
1	$0\frac{1}{4}$	3	$11\frac{1}{8}$	1	$4\frac{1}{2}$	4	$11\frac{5}{8}$	1	$8\frac{1}{2}$	6	$0\frac{1}{4}$	2	$0\frac{1}{2}$	7	$0\frac{3}{4}$
1	$0\frac{5}{8}$	3	$11\frac{1}{2}$	1	$4\frac{5}{8}$	5	0	1	$8\frac{5}{8}$	6	$0\frac{5}{8}$	2	$0\frac{5}{8}$	7	$1\frac{1}{8}$
1	$0\frac{3}{4}$	3	$11\frac{7}{8}$	1	$4\frac{3}{4}$	5	$0\frac{3}{8}$	1	$8\frac{3}{4}$	6	1	2	$0\frac{3}{4}$	7	$1\frac{1}{2}$
1	$0\frac{7}{8}$	4	$0\frac{1}{4}$	1	$4\frac{7}{8}$	5	$0\frac{7}{8}$	1	$8\frac{7}{8}$	6	$1\frac{3}{8}$	2	$0\frac{7}{8}$	7	2

For Angle Iron measuring $1\frac{1}{4}$ Inch thick, diagonally across the root.

FLANGE OUTSIDE.

INSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.		INSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.		INSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.		INSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.	
FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.
2	1	7	$2\frac{3}{8}$	2	5	8	$2\frac{7}{8}$	2	9	9	$3\frac{1}{2}$	3	1	10	4
2	$1\frac{1}{8}$	7	$2\frac{3}{4}$	2	$5\frac{1}{8}$	8	$3\frac{3}{8}$	2	$9\frac{1}{8}$	9	$3\frac{7}{8}$	3	$1\frac{1}{8}$	10	$4\frac{1}{2}$
2	$1\frac{1}{4}$	7	$3\frac{1}{8}$	2	$5\frac{1}{4}$	8	$3\frac{3}{4}$	2	$9\frac{1}{4}$	9	$4\frac{1}{4}$	3	$1\frac{1}{4}$	10	$4\frac{7}{8}$
2	$1\frac{3}{8}$	7	$3\frac{1}{2}$	2	$5\frac{3}{8}$	8	$4\frac{1}{8}$	2	$9\frac{3}{8}$	9	$4\frac{5}{8}$	3	$1\frac{3}{8}$	10	$5\frac{1}{4}$
2	$1\frac{1}{2}$	7	$3\frac{7}{8}$	2	$5\frac{1}{2}$	8	$4\frac{1}{2}$	2	$9\frac{1}{2}$	9	5	3	$1\frac{1}{2}$	10	$5\frac{5}{8}$
2	$1\frac{5}{8}$	7	$4\frac{3}{8}$	2	$5\frac{5}{8}$	8	$4\frac{7}{8}$	2	$9\frac{5}{8}$	9	$5\frac{1}{2}$	3	$1\frac{5}{8}$	10	6
2	$1\frac{3}{4}$	7	$4\frac{3}{4}$	2	$5\frac{3}{4}$	8	$5\frac{1}{4}$	2	$9\frac{3}{4}$	9	$5\frac{7}{8}$	3	$1\frac{3}{4}$	10	$6\frac{3}{8}$
2	$1\frac{7}{8}$	7	$5\frac{1}{8}$	2	$5\frac{7}{8}$	8	$5\frac{5}{8}$	2	$9\frac{7}{8}$	9	$6\frac{1}{4}$	3	$1\frac{7}{8}$	10	$6\frac{7}{8}$
2	2	7	$5\frac{1}{2}$	2	6	8	6	2	10	9	$6\frac{5}{8}$	3	2	10	$7\frac{1}{4}$
2	$2\frac{1}{8}$	7	$5\frac{7}{8}$	2	$6\frac{1}{8}$	8	$6\frac{1}{2}$	2	$10\frac{1}{8}$	9	7	3	$2\frac{1}{8}$	10	$7\frac{5}{8}$
2	$2\frac{1}{4}$	7	$6\frac{1}{4}$	2	$6\frac{1}{4}$	8	$6\frac{7}{8}$	2	$10\frac{1}{4}$	9	$7\frac{3}{8}$	3	$2\frac{1}{4}$	10	8
2	$2\frac{3}{8}$	7	$6\frac{5}{8}$	2	$6\frac{3}{8}$	8	$7\frac{1}{4}$	2	$10\frac{3}{8}$	9	$7\frac{7}{8}$	3	$2\frac{3}{8}$	10	$8\frac{3}{8}$
2	$2\frac{1}{2}$	7	7	2	$6\frac{1}{2}$	8	$7\frac{5}{8}$	2	$10\frac{1}{2}$	9	$8\frac{1}{4}$	3	$2\frac{1}{2}$	10	$8\frac{3}{4}$
2	$2\frac{5}{8}$	7	$7\frac{1}{2}$	2	$6\frac{5}{8}$	8	8	2	$10\frac{5}{8}$	9	$8\frac{5}{8}$	3	$2\frac{5}{8}$	10	$9\frac{1}{8}$
2	$2\frac{3}{4}$	7	$7\frac{7}{8}$	2	$6\frac{3}{4}$	8	$8\frac{3}{8}$	2	$10\frac{3}{4}$	9	9	3	$2\frac{3}{4}$	10	$9\frac{1}{2}$
2	$2\frac{7}{8}$	7	$8\frac{1}{4}$	2	$6\frac{7}{8}$	8	$8\frac{7}{8}$	2	$10\frac{7}{8}$	9	$9\frac{3}{8}$	3	$2\frac{7}{8}$	10	$9\frac{7}{8}$
2	3	7	$8\frac{5}{8}$	2	7	8	$9\frac{1}{4}$	2	11	9	$9\frac{3}{4}$	3	3	10	$10\frac{3}{8}$
2	$3\frac{1}{8}$	7	9	2	$7\frac{1}{8}$	8	$9\frac{5}{8}$	2	$11\frac{1}{8}$	9	$10\frac{1}{8}$	3	$3\frac{1}{8}$	10	$10\frac{3}{4}$
2	$3\frac{1}{4}$	7	$9\frac{3}{8}$	2	$7\frac{1}{4}$	8	10	2	$11\frac{1}{4}$	9	$10\frac{1}{2}$	3	$3\frac{1}{4}$	10	$11\frac{1}{8}$
2	$3\frac{3}{8}$	7	$9\frac{3}{4}$	2	$7\frac{3}{8}$	8	$10\frac{3}{8}$	2	$11\frac{3}{8}$	9	$10\frac{7}{8}$	3	$3\frac{3}{8}$	10	$11\frac{1}{2}$
2	$3\frac{1}{2}$	7	$10\frac{1}{4}$	2	$7\frac{1}{2}$	8	$10\frac{3}{4}$	2	$11\frac{1}{2}$	9	$11\frac{3}{8}$	3	$3\frac{1}{2}$	10	$11\frac{7}{8}$
2	$3\frac{5}{8}$	7	$10\frac{5}{8}$	2	$7\frac{5}{8}$	8	$11\frac{1}{8}$	2	$11\frac{5}{8}$	9	$11\frac{3}{4}$	3	$3\frac{5}{8}$	11	$0\frac{3}{8}$
2	$3\frac{3}{4}$	7	11	2	$7\frac{3}{4}$	8	$11\frac{1}{2}$	2	$11\frac{3}{4}$	10	$0\frac{1}{8}$	3	$3\frac{3}{4}$	11	$0\frac{3}{4}$
2	$3\frac{7}{8}$	7	$11\frac{3}{8}$	2	$7\frac{7}{8}$	9	0	2	$11\frac{7}{8}$	10	$0\frac{1}{2}$	3	$3\frac{7}{8}$	11	$1\frac{1}{8}$
2	4	7	$11\frac{3}{4}$	2	8	9	$0\frac{3}{8}$	3	0	10	$0\frac{7}{8}$	3	4	11	$1\frac{1}{2}$
2	$4\frac{1}{8}$	8	$0\frac{1}{8}$	2	$8\frac{1}{8}$	9	$0\frac{3}{4}$	3	$0\frac{1}{8}$	10	$1\frac{3}{8}$	3	$4\frac{1}{8}$	11	$1\frac{7}{8}$
2	$4\frac{1}{4}$	8	$0\frac{1}{2}$	2	$8\frac{1}{4}$	9	$1\frac{1}{8}$	3	$0\frac{1}{4}$	10	$1\frac{3}{4}$	3	$4\frac{1}{4}$	11	$2\frac{1}{4}$
2	$4\frac{3}{8}$	8	1	2	$8\frac{3}{8}$	9	$1\frac{1}{2}$	3	$0\frac{3}{8}$	10	$2\frac{1}{8}$	3	$4\frac{3}{8}$	11	$2\frac{5}{8}$
2	$4\frac{1}{2}$	8	$1\frac{3}{8}$	2	$8\frac{1}{2}$	9	$1\frac{7}{8}$	3	$0\frac{1}{2}$	10	$2\frac{1}{2}$	3	$4\frac{1}{2}$	11	3
2	$4\frac{5}{8}$	8	$1\frac{3}{4}$	2	$8\frac{5}{8}$	9	$2\frac{3}{8}$	3	$0\frac{5}{8}$	10	$2\frac{7}{8}$	3	$4\frac{5}{8}$	11	$3\frac{1}{2}$
2	$4\frac{3}{4}$	8	$2\frac{1}{8}$	2	$8\frac{3}{4}$	9	$2\frac{3}{4}$	3	$0\frac{3}{4}$	10	$3\frac{1}{4}$	3	$4\frac{3}{4}$	11	$3\frac{7}{8}$
2	$4\frac{7}{8}$	8	$2\frac{1}{2}$	2	$8\frac{7}{8}$	9	$3\frac{1}{8}$	3	$0\frac{7}{8}$	10	$3\frac{5}{8}$	3	$4\frac{7}{8}$	11	$4\frac{1}{4}$

For Angle Iron measuring $1\frac{1}{4}$ Inch thick, diagonally across the root.

FLANGE OUTSIDE.

Inside diameter of ring.		Length required for ring.		Inside diameter of ring.		Length required for ring.		Inside diameter of ring.		Length required for ring.		Inside diameter of ring.		Length required for ring.	
Ft.	In.	Ft.	In.	Ft.	In.	Ft.	In.	Ft.	In.	Ft.	In.	Ft.	In.	Ft.	In.
3	5	11	4⅝	3	9	12	5¼	4	1	13	5¾	4	5	14	6⅜
3	5⅛	11	5	3	9⅛	12	5⅝	4	1⅛	13	6⅛	4	5⅛	14	6¾
3	5¼	11	5⅜	3	9¼	12	6	4	1¼	13	6½	4	5¼	14	7⅛
3	5⅜	11	5¾	3	9⅜	12	6⅜	4	1⅜	13	7	4	5⅜	14	7½
3	5½	11	6¼	3	9½	12	6¾	4	1½	13	7⅜	4	5½	14	7⅞
3	5⅝	11	6⅝	3	9⅝	12	7⅛	4	1⅝	13	7¾	4	5⅝	14	8¼
3	5¾	11	7	3	9¾	12	7½	4	1¾	13	8⅛	4	5¾	14	8¾
3	5⅞	11	7⅜	3	9⅞	12	7⅞	4	1⅞	13	8½	4	5⅞	14	9⅛
3	6	11	7¾	3	10	12	8⅜	4	2	13	8⅞	4	6	14	9½
3	6⅛	11	8⅛	3	10⅛	12	8¾	4	2⅛	13	9¼	4	6⅛	14	9⅞
3	6¼	11	8½	3	10¼	12	9⅛	4	2¼	13	9⅝	4	6¼	14	10¼
3	6⅜	11	8⅞	3	10⅜	12	9½	4	2⅜	13	10⅛	4	6⅜	14	10⅝
3	6½	11	9⅜	3	10½	12	9⅞	4	2½	13	10½	4	6½	14	11
3	6⅝	11	9¾	3	10⅝	12	10⅜	4	2⅝	13	10⅞	4	6⅝	14	11½
3	6¾	11	10⅛	3	10¾	12	10¾	4	2¾	13	11¼	4	6¾	14	11⅞
3	6⅞	11	10½	3	10⅞	12	11⅛	4	2⅞	13	11⅝	4	6⅞	15	0¼
3	7	11	10⅞	3	11	12	11½	4	3	14	0	4	7	15	0⅝
3	7⅛	11	11¼	3	11⅛	12	11⅞	4	3⅛	14	0⅜	4	7⅛	15	1
3	7¼	11	11⅝	3	11¼	13	0¼	4	3¼	14	0⅞	4	7¼	15	1⅜
3	7⅜	12	0⅛	3	11⅜	13	0⅝	4	3⅜	14	1¼	4	7⅜	15	1⅞
3	7½	12	0½	3	11½	13	1	4	3½	14	1⅝	4	7½	15	2¼
3	7⅝	12	0⅞	3	11⅝	13	1½	4	3⅝	14	2	4	7⅝	15	2⅝
3	7¾	12	1¼	3	11¾	13	1⅞	4	3¾	14	2⅜	4	7¾	15	3
3	7⅞	12	1⅝	3	11⅞	13	2¼	4	3⅞	14	2¾	4	7⅞	15	3⅜
3	8	12	2	4	0	13	2⅝	4	4	14	3⅛	4	8	15	3¾
3	8⅛	12	2⅜	4	0⅛	13	3	4	4⅛	14	3½	4	8⅛	15	4⅛
3	8¼	12	2⅞	4	0¼	13	3⅜	4	4¼	14	4	4	8¼	15	4½
3	8⅜	12	3¼	4	0⅜	13	3¾	4	4⅜	14	4⅜	4	8⅜	15	4⅞
3	8½	12	3⅝	4	0½	13	4¼	4	4½	14	4¾	4	8½	15	5⅜
3	8⅝	12	4	4	0⅝	13	4⅝	4	4⅝	14	5⅛	4	8⅝	15	5¾
3	8¾	12	4⅜	4	0¾	13	5	4	4¾	14	5½	4	8¾	15	6⅛
3	8⅞	12	4¾	4	0⅞	13	5⅜	4	4⅞	14	5⅞	4	8⅞	15	6½

For Angle Iron measuring $1\frac{1}{4}$ Inch thick, diagonally across the root.

FLANGE OUTSIDE.

INSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.		INSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.		INSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.		INSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.	
FT.	IN.	FT.	IN.	FT.	IN.	FT	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.
4	9	15	$6\frac{7}{8}$	5	1	16	$7\frac{1}{2}$	5	5	17	8	5	9	18	$8\frac{5}{8}$
4	$9\frac{1}{8}$	15	$7\frac{1}{4}$	5	$1\frac{1}{8}$	16	$7\frac{7}{8}$	5	$5\frac{1}{8}$	17	$8\frac{3}{8}$	5	$9\frac{1}{8}$	18	9
4	$9\frac{1}{4}$	15	$7\frac{3}{4}$	5	$1\frac{1}{4}$	16	$8\frac{1}{4}$	5	$5\frac{1}{4}$	17	$8\frac{7}{8}$	5	$9\frac{1}{4}$	18	$9\frac{3}{8}$
4	$9\frac{3}{8}$	15	$8\frac{1}{8}$	5	$1\frac{3}{8}$	16	$8\frac{5}{8}$	5	$5\frac{3}{8}$	17	$9\frac{1}{4}$	5	$9\frac{3}{8}$	18	$9\frac{3}{4}$
4	$9\frac{1}{2}$	15	$8\frac{1}{2}$	5	$1\frac{1}{2}$	16	9	5	$5\frac{1}{2}$	17	$9\frac{5}{8}$	5	$9\frac{1}{2}$	18	$10\frac{1}{8}$
4	$9\frac{5}{8}$	15	$8\frac{7}{8}$	5	$1\frac{5}{8}$	16	$9\frac{3}{8}$	5	$5\frac{5}{8}$	17	10	5	$9\frac{5}{8}$	18	$10\frac{1}{2}$
4	$9\frac{3}{4}$	15	$9\frac{1}{4}$	5	$1\frac{3}{4}$	16	$9\frac{7}{8}$	5	$5\frac{3}{4}$	17	$10\frac{3}{8}$	5	$9\frac{3}{4}$	18	11
4	$9\frac{7}{8}$	15	$9\frac{5}{8}$	5	$1\frac{7}{8}$	16	$10\frac{1}{4}$	5	$5\frac{7}{8}$	17	$10\frac{3}{4}$	5	$9\frac{7}{8}$	18	$11\frac{3}{8}$
4	10	15	10	5	2	16	$10\frac{5}{8}$	5	6	17	$11\frac{1}{8}$	5	10	18	$11\frac{3}{4}$
4	$10\frac{1}{8}$	15	$10\frac{3}{8}$	5	$2\frac{1}{8}$	16	11	5	$6\frac{1}{8}$	17	$11\frac{1}{2}$	5	$10\frac{1}{8}$	19	$0\frac{1}{8}$
4	$10\frac{1}{4}$	15	$10\frac{7}{8}$	5	$2\frac{1}{4}$	16	$11\frac{3}{8}$	5	$6\frac{1}{4}$	18	0	5	$10\frac{1}{4}$	19	$0\frac{1}{2}$
4	$10\frac{3}{8}$	15	$11\frac{1}{4}$	5	$2\frac{3}{8}$	16	$11\frac{3}{4}$	5	$6\frac{3}{8}$	18	$0\frac{3}{8}$	5	$10\frac{3}{8}$	19	$0\frac{7}{8}$
4	$10\frac{1}{2}$	15	$11\frac{5}{8}$	5	$2\frac{1}{2}$	17	$0\frac{1}{8}$	5	$6\frac{1}{2}$	18	$0\frac{3}{4}$	5	$10\frac{1}{2}$	19	$1\frac{3}{8}$
4	$10\frac{5}{8}$	16	0	5	$2\frac{5}{8}$	17	$0\frac{5}{8}$	5	$6\frac{5}{8}$	18	$1\frac{1}{8}$	5	$10\frac{5}{8}$	19	$1\frac{3}{4}$
4	$10\frac{3}{4}$	16	$0\frac{3}{8}$	5	$2\frac{3}{4}$	17	1	5	$6\frac{3}{4}$	18	$1\frac{1}{2}$	5	$10\frac{3}{4}$	19	$2\frac{1}{8}$
4	$10\frac{7}{8}$	16	$0\frac{3}{4}$	5	$2\frac{7}{8}$	17	$1\frac{3}{8}$	5	$6\frac{7}{8}$	18	$1\frac{7}{8}$	5	$10\frac{7}{8}$	19	$2\frac{1}{2}$
4	11	16	$1\frac{1}{8}$	5	3	17	$1\frac{3}{4}$	5	7	18	$2\frac{3}{8}$	5	11	19	$2\frac{7}{8}$
4	$11\frac{1}{8}$	16	$1\frac{5}{8}$	5	$3\frac{1}{8}$	17	$2\frac{1}{8}$	5	$7\frac{1}{8}$	18	$2\frac{3}{4}$	5	$11\frac{1}{8}$	19	$3\frac{1}{4}$
4	$11\frac{1}{4}$	16	2	5	$3\frac{1}{4}$	17	$2\frac{1}{2}$	5	$7\frac{1}{4}$	18	$3\frac{1}{8}$	5	$11\frac{1}{4}$	19	$3\frac{5}{8}$
4	$11\frac{3}{8}$	16	$2\frac{3}{8}$	5	$3\frac{3}{8}$	17	$2\frac{7}{8}$	5	$7\frac{3}{8}$	18	$3\frac{1}{2}$	5	$11\frac{3}{8}$	19	4
4	$11\frac{1}{2}$	16	$2\frac{3}{4}$	5	$3\frac{1}{2}$	17	$3\frac{3}{8}$	5	$7\frac{1}{2}$	18	$3\frac{7}{8}$	5	$11\frac{1}{2}$	19	$4\frac{1}{2}$
4	$11\frac{5}{8}$	16	$3\frac{1}{8}$	5	$3\frac{5}{8}$	17	$3\frac{3}{4}$	5	$7\frac{5}{8}$	18	$4\frac{1}{4}$	5	$11\frac{5}{8}$	19	$4\frac{7}{8}$
4	$11\frac{3}{4}$	16	$3\frac{1}{2}$	5	$3\frac{3}{4}$	17	$4\frac{1}{8}$	5	$7\frac{3}{4}$	18	$4\frac{5}{8}$	5	$11\frac{3}{4}$	19	$5\frac{1}{4}$
4	$11\frac{7}{8}$	16	$3\frac{7}{8}$	5	$3\frac{7}{8}$	17	$4\frac{1}{2}$	5	$7\frac{7}{8}$	18	5	5	$11\frac{7}{8}$	19	$5\frac{5}{8}$
5	0	16	$4\frac{3}{8}$	5	4	17	$4\frac{7}{8}$	5	8	18	$5\frac{1}{2}$	6	0	19	6
5	$0\frac{1}{8}$	16	$4\frac{3}{4}$	5	$4\frac{1}{8}$	17	$5\frac{1}{4}$	5	$8\frac{1}{8}$	18	$5\frac{7}{8}$	6	$0\frac{1}{8}$	19	$6\frac{3}{8}$
5	$0\frac{1}{4}$	16	$5\frac{1}{8}$	5	$4\frac{1}{4}$	17	$5\frac{5}{8}$	5	$8\frac{1}{4}$	18	$6\frac{1}{4}$	6	$0\frac{1}{4}$	19	$6\frac{7}{8}$
5	$0\frac{3}{8}$	16	$5\frac{1}{2}$	5	$4\frac{3}{8}$	17	6	5	$8\frac{3}{8}$	18	$6\frac{5}{8}$	6	$0\frac{3}{8}$	19	$7\frac{1}{4}$
5	$0\frac{1}{2}$	16	$5\frac{7}{8}$	5	$4\frac{1}{2}$	17	$6\frac{1}{2}$	5	$8\frac{1}{2}$	18	7	6	$0\frac{1}{2}$	19	$7\frac{5}{8}$
5	$0\frac{5}{8}$	16	$6\frac{1}{4}$	5	$4\frac{5}{8}$	17	$6\frac{7}{8}$	5	$8\frac{5}{8}$	18	$7\frac{3}{8}$	6	$0\frac{5}{8}$	19	8
5	$0\frac{3}{4}$	16	$6\frac{5}{8}$	5	$4\frac{3}{4}$	17	$7\frac{1}{4}$	5	$8\frac{3}{4}$	18	$7\frac{7}{8}$	6	$0\frac{3}{4}$	19	$8\frac{3}{8}$
5	$0\frac{7}{8}$	16	7	5	$4\frac{7}{8}$	17	$7\frac{5}{8}$	5	$8\frac{7}{8}$	18	$8\frac{1}{4}$	6	$0\frac{7}{8}$	19	$8\frac{3}{4}$

For Angle Iron measuring $1\frac{1}{4}$ Inch thick, diagonally across the root.

FLANGE OUTSIDE.

Inside Diameter of Ring.		Length Required for Ring.		Inside Diameter of Ring.		Length Required for Ring.		Inside Diameter of Ring.		Length Required for Ring.		Inside Diameter of Ring.		Length Required for Ring.	
Ft.	In.	Ft.	In.	Ft.	In.	Ft.	In.	Ft.	In.	Ft.	In.	Ft.	In.	Ft.	In.
6	1	19	$9\frac{1}{8}$	6	5	20	$9\frac{3}{4}$	6	9	21	$10\frac{3}{8}$	7	1	22	$10\frac{7}{8}$
6	$1\frac{1}{8}$	19	$9\frac{5}{8}$	6	$5\frac{1}{8}$	20	$10\frac{1}{8}$	6	$9\frac{1}{8}$	21	$10\frac{3}{4}$	7	$1\frac{1}{8}$	22	$11\frac{1}{4}$
6	$1\frac{1}{4}$	19	10	6	$5\frac{1}{4}$	20	$10\frac{1}{2}$	6	$9\frac{1}{4}$	21	$11\frac{1}{8}$	7	$1\frac{1}{4}$	22	$11\frac{5}{8}$
6	$1\frac{3}{8}$	19	$10\frac{3}{8}$	6	$5\frac{3}{8}$	20	$10\frac{7}{8}$	6	$9\frac{3}{8}$	21	$11\frac{1}{2}$	7	$1\frac{3}{8}$	23	0
6	$1\frac{1}{2}$	19	$10\frac{3}{4}$	6	$5\frac{1}{2}$	20	$11\frac{3}{8}$	6	$9\frac{1}{2}$	21	$11\frac{7}{8}$	7	$1\frac{1}{2}$	23	$0\frac{1}{2}$
6	$1\frac{5}{8}$	19	$11\frac{1}{8}$	6	$5\frac{5}{8}$	20	$11\frac{3}{4}$	6	$9\frac{5}{8}$	22	$0\frac{1}{4}$	7	$1\frac{5}{8}$	23	$0\frac{7}{8}$
6	$1\frac{3}{4}$	19	$11\frac{1}{2}$	6	$5\frac{3}{4}$	21	$0\frac{1}{8}$	6	$9\frac{3}{4}$	22	$0\frac{5}{8}$	7	$1\frac{3}{4}$	23	$1\frac{1}{4}$
6	$1\frac{7}{8}$	19	$11\frac{7}{8}$	6	$5\frac{7}{8}$	21	$0\frac{1}{2}$	6	$9\frac{7}{8}$	22	1	7	$1\frac{7}{8}$	23	$1\frac{5}{8}$
6	2	20	$0\frac{3}{8}$	6	6	21	$0\frac{7}{8}$	6	10	22	$1\frac{1}{2}$	7	2	23	2
6	$2\frac{1}{8}$	20	$0\frac{3}{4}$	6	$6\frac{1}{8}$	21	$1\frac{1}{4}$	6	$10\frac{1}{8}$	22	$1\frac{7}{8}$	7	$2\frac{1}{8}$	23	$2\frac{3}{8}$
6	$2\frac{1}{4}$	20	$1\frac{1}{8}$	6	$6\frac{1}{4}$	21	$1\frac{5}{8}$	6	$10\frac{1}{4}$	22	$2\frac{1}{4}$	7	$2\frac{1}{4}$	23	$2\frac{3}{4}$
6	$2\frac{3}{8}$	20	$1\frac{1}{2}$	6	$6\frac{3}{8}$	21	2	6	$10\frac{3}{8}$	22	$2\frac{5}{8}$	7	$2\frac{3}{8}$	23	$3\frac{1}{4}$
6	$2\frac{1}{2}$	20	$1\frac{7}{8}$	6	$6\frac{1}{2}$	21	$2\frac{1}{2}$	6	$10\frac{1}{2}$	22	3	7	$2\frac{1}{2}$	23	$3\frac{5}{8}$
6	$2\frac{5}{8}$	20	$2\frac{1}{4}$	6	$6\frac{5}{8}$	21	$2\frac{7}{8}$	6	$10\frac{5}{8}$	22	$3\frac{3}{8}$	7	$2\frac{5}{8}$	23	4
6	$2\frac{3}{4}$	20	$2\frac{5}{8}$	6	$6\frac{3}{4}$	21	$3\frac{1}{4}$	6	$10\frac{3}{4}$	22	$3\frac{7}{8}$	7	$2\frac{3}{4}$	23	$4\frac{3}{8}$
6	$2\frac{7}{8}$	20	3	6	$6\frac{7}{8}$	21	$3\frac{5}{8}$	6	$10\frac{7}{8}$	22	$4\frac{1}{4}$	7	$2\frac{7}{8}$	23	$4\frac{3}{4}$
6	3	20	$3\frac{1}{2}$	6	7	21	4	6	11	22	$4\frac{5}{8}$	7	3	23	$5\frac{1}{8}$
6	$3\frac{1}{8}$	20	$3\frac{7}{8}$	6	$7\frac{1}{8}$	21	$4\frac{3}{8}$	6	$11\frac{1}{8}$	22	5	7	$3\frac{1}{8}$	23	$5\frac{1}{2}$
6	$3\frac{1}{4}$	20	$4\frac{1}{4}$	6	$7\frac{1}{4}$	21	$4\frac{3}{4}$	6	$11\frac{1}{4}$	22	$5\frac{3}{8}$	7	$3\frac{1}{4}$	23	6
6	$3\frac{3}{8}$	20	$4\frac{5}{8}$	6	$7\frac{3}{8}$	21	$5\frac{1}{8}$	6	$11\frac{3}{8}$	22	$5\frac{3}{4}$	7	$3\frac{3}{8}$	23	$6\frac{3}{8}$
6	$3\frac{1}{2}$	20	5	6	$7\frac{1}{2}$	21	$5\frac{1}{2}$	6	$11\frac{1}{2}$	22	$6\frac{1}{8}$	7	$3\frac{1}{2}$	23	$6\frac{3}{4}$
6	$3\frac{5}{8}$	20	$5\frac{3}{8}$	6	$7\frac{5}{8}$	21	6	6	$11\frac{5}{8}$	22	$6\frac{1}{2}$	7	$3\frac{5}{8}$	23	$7\frac{1}{8}$
6	$3\frac{3}{4}$	20	$5\frac{7}{8}$	6	$7\frac{3}{4}$	21	$6\frac{3}{8}$	6	$11\frac{3}{4}$	22	7	7	$3\frac{3}{4}$	23	$7\frac{1}{2}$
6	$3\frac{7}{8}$	20	$6\frac{1}{4}$	6	$7\frac{7}{8}$	21	$6\frac{3}{4}$	6	$11\frac{7}{8}$	22	$7\frac{3}{8}$	7	$3\frac{7}{8}$	23	$7\frac{7}{8}$
6	4	20	$6\frac{5}{8}$	6	8	21	$7\frac{1}{8}$	7	0	22	$7\frac{3}{4}$	7	4	23	$8\frac{1}{4}$
6	$4\frac{1}{8}$	20	7	6	$8\frac{1}{8}$	21	$7\frac{5}{8}$	7	$0\frac{1}{8}$	22	$8\frac{1}{8}$	7	$4\frac{1}{8}$	23	$8\frac{3}{4}$
6	$4\frac{1}{4}$	20	$7\frac{3}{8}$	6	$8\frac{1}{4}$	21	8	7	$0\frac{1}{4}$	22	$8\frac{1}{2}$	7	$4\frac{1}{4}$	23	$9\frac{1}{8}$
6	$4\frac{3}{8}$	20	$7\frac{3}{4}$	6	$8\frac{3}{8}$	21	$8\frac{3}{8}$	7	$0\frac{3}{8}$	22	$8\frac{7}{8}$	7	$4\frac{3}{8}$	23	$9\frac{1}{2}$
6	$4\frac{1}{2}$	20	$8\frac{1}{8}$	6	$8\frac{1}{2}$	21	$8\frac{3}{4}$	7	$0\frac{1}{2}$	22	$9\frac{1}{4}$	7	$4\frac{1}{2}$	23	$9\frac{7}{8}$
6	$4\frac{5}{8}$	20	$8\frac{1}{2}$	6	$8\frac{5}{8}$	21	$9\frac{1}{8}$	7	$0\frac{5}{8}$	22	$9\frac{3}{4}$	7	$4\frac{5}{8}$	23	$10\frac{1}{4}$
6	$4\frac{3}{4}$	20	9	6	$8\frac{3}{4}$	21	$9\frac{1}{2}$	7	$0\frac{3}{4}$	22	$10\frac{1}{8}$	7	$4\frac{3}{4}$	23	$10\frac{5}{8}$
6	$4\frac{7}{8}$	20	$9\frac{3}{8}$	6	$8\frac{7}{8}$	21	$9\frac{7}{8}$	7	$0\frac{7}{8}$	22	$10\frac{1}{2}$	7	$4\frac{7}{8}$	23	11

For Angle Iron measuring $1\frac{1}{4}$ Inch thick, diagonally across the root.

FLANGE OUTSIDE.

INSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.		INSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.		INSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.		INSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.	
FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.
7	5	23	$11\frac{1}{2}$	7	9	25	0	8	1	26	$0\frac{5}{8}$	8	5	27	$1\frac{1}{8}$
7	$5\frac{1}{8}$	23	$11\frac{7}{8}$	7	$9\frac{1}{8}$	25	$0\frac{3}{8}$	8	$1\frac{1}{8}$	26	1	8	$5\frac{1}{8}$	27	$1\frac{1}{2}$
7	$5\frac{1}{4}$	24	$0\frac{1}{4}$	7	$9\frac{1}{4}$	25	$0\frac{3}{4}$	8	$1\frac{1}{4}$	26	$1\frac{3}{8}$	8	$5\frac{1}{4}$	27	$1\frac{7}{8}$
7	$5\frac{3}{8}$	24	$0\frac{5}{8}$	7	$9\frac{3}{8}$	25	$1\frac{1}{4}$	8	$1\frac{3}{8}$	26	$1\frac{3}{4}$	8	$5\frac{3}{8}$	27	$2\frac{3}{8}$
7	$5\frac{1}{2}$	24	1	7	$9\frac{1}{2}$	25	$1\frac{5}{8}$	8	$1\frac{1}{2}$	26	$2\frac{1}{8}$	8	$5\frac{1}{2}$	27	$2\frac{3}{4}$
7	$5\frac{5}{8}$	24	$1\frac{3}{8}$	7	$9\frac{5}{8}$	25	2	8	$1\frac{5}{8}$	26	$2\frac{1}{2}$	8	$5\frac{5}{8}$	27	$3\frac{1}{8}$
7	$5\frac{3}{4}$	24	$1\frac{3}{4}$	7	$9\frac{3}{4}$	25	$2\frac{3}{8}$	8	$1\frac{3}{4}$	26	$2\frac{7}{8}$	8	$5\frac{3}{4}$	27	$3\frac{1}{2}$
7	$5\frac{7}{8}$	24	$2\frac{1}{4}$	7	$9\frac{7}{8}$	25	$2\frac{3}{4}$	8	$1\frac{7}{8}$	26	$3\frac{3}{8}$	8	$5\frac{7}{8}$	27	$3\frac{7}{8}$
7	6	24	$2\frac{5}{8}$	7	10	25	$3\frac{1}{8}$	8	2	26	$3\frac{3}{4}$	8	6	27	$4\frac{1}{4}$
7	$6\frac{1}{8}$	24	3	7	$10\frac{1}{8}$	25	$3\frac{1}{2}$	8	$2\frac{1}{8}$	26	$4\frac{1}{8}$	8	$6\frac{1}{8}$	27	$4\frac{5}{8}$
7	$6\frac{1}{4}$	24	$3\frac{3}{8}$	7	$10\frac{1}{4}$	25	$3\frac{7}{8}$	8	$2\frac{1}{4}$	26	$4\frac{1}{2}$	8	$6\frac{1}{4}$	27	5
7	$6\frac{3}{8}$	24	$3\frac{3}{4}$	7	$10\frac{3}{8}$	25	$4\frac{3}{8}$	8	$2\frac{3}{8}$	26	$4\frac{7}{8}$	8	$6\frac{3}{8}$	27	$5\frac{1}{2}$
7	$6\frac{1}{2}$	24	$4\frac{1}{8}$	7	$10\frac{1}{2}$	25	$4\frac{3}{4}$	8	$2\frac{1}{2}$	26	$5\frac{1}{4}$	8	$6\frac{1}{2}$	27	$5\frac{7}{8}$
7	$6\frac{5}{8}$	24	$4\frac{1}{2}$	7	$10\frac{5}{8}$	25	$5\frac{1}{8}$	8	$2\frac{5}{8}$	26	$5\frac{5}{8}$	8	$6\frac{5}{8}$	27	$6\frac{1}{4}$
7	$6\frac{3}{4}$	24	$4\frac{7}{8}$	7	$10\frac{3}{4}$	25	$5\frac{1}{2}$	8	$2\frac{3}{4}$	26	6	8	$6\frac{3}{4}$	27	$6\frac{5}{8}$
7	$6\frac{7}{8}$	24	$5\frac{3}{8}$	7	$10\frac{7}{8}$	25	$5\frac{7}{8}$	8	$2\frac{7}{8}$	26	$6\frac{1}{2}$	8	$6\frac{7}{8}$	27	7
7	7	24	$5\frac{3}{4}$	7	11	25	$6\frac{1}{4}$	8	3	26	$6\frac{7}{8}$	8	7	27	$7\frac{3}{8}$
7	$7\frac{1}{8}$	24	$6\frac{1}{8}$	7	$11\frac{1}{8}$	25	$6\frac{5}{8}$	8	$3\frac{1}{8}$	26	$7\frac{1}{4}$	8	$7\frac{1}{8}$	27	$7\frac{7}{8}$
7	$7\frac{1}{4}$	24	$6\frac{1}{2}$	7	$11\frac{1}{4}$	25	7	8	$3\frac{1}{4}$	26	$7\frac{5}{8}$	8	$7\frac{1}{4}$	27	$8\frac{1}{4}$
7	$7\frac{3}{8}$	24	$6\frac{7}{8}$	7	$11\frac{3}{8}$	25	$7\frac{1}{2}$	8	$3\frac{3}{8}$	26	8	8	$7\frac{3}{8}$	27	$8\frac{5}{8}$
7	$7\frac{1}{2}$	24	$7\frac{1}{4}$	7	$11\frac{1}{2}$	25	$7\frac{7}{8}$	8	$3\frac{1}{2}$	26	$8\frac{3}{8}$	8	$7\frac{1}{2}$	27	9
7	$7\frac{5}{8}$	24	$7\frac{5}{8}$	7	$11\frac{5}{8}$	25	$8\frac{1}{4}$	8	$3\frac{5}{8}$	26	$8\frac{7}{8}$	8	$7\frac{5}{8}$	27	$9\frac{3}{8}$
7	$7\frac{3}{4}$	24	8	7	$11\frac{3}{4}$	25	$8\frac{5}{8}$	8	$3\frac{3}{4}$	26	$9\frac{1}{4}$	8	$7\frac{3}{4}$	27	$9\frac{3}{4}$
7	$7\frac{7}{8}$	24	$8\frac{1}{2}$	7	$11\frac{7}{8}$	25	9	8	$3\frac{7}{8}$	26	$9\frac{5}{8}$	8	$7\frac{7}{8}$	27	$10\frac{1}{8}$
7	8	24	$8\frac{7}{8}$	8	0	25	$9\frac{1}{2}$	8	4	26	10	8	8	27	$10\frac{5}{8}$
7	$8\frac{1}{8}$	24	$9\frac{1}{4}$	8	$0\frac{1}{8}$	25	$9\frac{7}{8}$	8	$4\frac{1}{8}$	26	$10\frac{3}{8}$	8	$8\frac{1}{8}$	27	11
7	$8\frac{1}{4}$	24	$9\frac{5}{8}$	8	$0\frac{1}{4}$	25	$10\frac{1}{4}$	8	$4\frac{1}{4}$	26	$10\frac{3}{4}$	8	$8\frac{1}{4}$	27	$11\frac{3}{8}$
7	$8\frac{3}{8}$	24	10	8	$0\frac{3}{8}$	25	$10\frac{5}{8}$	8	$4\frac{3}{8}$	26	$11\frac{1}{8}$	8	$8\frac{3}{8}$	27	$11\frac{3}{4}$
7	$8\frac{1}{2}$	24	$10\frac{1}{2}$	8	$0\frac{1}{2}$	25	11	8	$4\frac{1}{2}$	26	$11\frac{1}{2}$	8	$8\frac{1}{2}$	28	$0\frac{1}{8}$
7	$8\frac{5}{8}$	24	$10\frac{7}{8}$	8	$0\frac{5}{8}$	25	$11\frac{3}{8}$	8	$4\frac{5}{8}$	27	0	8	$8\frac{5}{8}$	28	$0\frac{1}{2}$
7	$8\frac{3}{4}$	24	$11\frac{1}{4}$	8	$0\frac{3}{4}$	25	$11\frac{3}{4}$	8	$4\frac{3}{4}$	27	$0\frac{3}{8}$	8	$8\frac{3}{4}$	28	$0\frac{7}{8}$
7	$8\frac{7}{8}$	24	$11\frac{5}{8}$	8	$0\frac{7}{8}$	26	$0\frac{1}{8}$	8	$4\frac{7}{8}$	27	$0\frac{3}{4}$	8	$8\frac{7}{8}$	28	$1\frac{3}{8}$

THE BOILER-MAKERS'

AND

IRON SHIP-BUILDERS' COMPANION.

SECTION II.

Tables for the formation of Circular and Oval Angled Iron Rings,

FLANGE INSIDE.

FIG. 1.

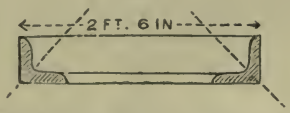


Figure 1 represents an angled iron ring, whose outside diameter is supposed to be 2 feet 6 inches, made of angled iron, measuring ¾ of an inch thick diagonally across the root of the bar. In table 14, page 84, in the column of lengths, opposite the given diameter, is 7ft. 5½in, the length required for a ring of such dimensions.

EXAMPLES.—What length of angled iron, measuring 1 inch thick, diagonally across the root of the bar, is required to make a ring, the outside diameter being 6 feet 9 inches? In table 16, page 99, opposite 6 feet 9 inches, is 20 feet 8⅛ inches, the length required.

What length of angled iron, which measures ½ an inch thick, diagonally across the root of the bar, will make a ring, the outside diameter being 2 feet 3 inches? In table 12, page 72, opposite the given diameter, is 6 feet 9⅝ inches, the length required.

To make an angled iron ring, in two equal parts, jump jointed, measuring ⅜ of an inch thick diagonally across the root of the bar,

whose outside diameter is 5 feet 4 inches. To find the length required for one of the parts: in table 11, page 68, opposite the given diameter, is 16 feet $6\frac{5}{8}$ inches, which, if divided by 2, gives 8 feet $3\frac{5}{16}$ inches, the length required for one half the ring.

FIG. 2.

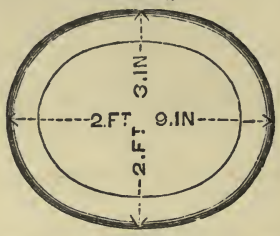


Figure 2 represents an oval ring, whose axis are 2 feet 9 inches, and 2 feet 3 inches. To find the length for any size of such ring, reduce the two axis to a diameter, by adding them together, and divide their product by 2.

EXAMPLE—What length of angled iron is required to form an oval ring whose axis are 2 feet 9 inches and 2 feet 3 inches, to be made of angled iron, measuring $\frac{3}{4}$ of an inch thick diagonally across the root of the bar—

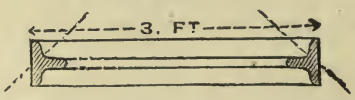
2 feet 9 inches.
2 ,, 3 ,,

2 | 5 ,, 0 ,,

2 ,, 6 ,, the diameter required.

In table 14, page 84, opposite 2 feet 6 inches, outside diameter, is 7 feet $5\frac{1}{2}$ inches, the length required.

FIG. 3.



To make a ring as figure 3, whose outside diameter equals 3 feet to be formed of T iron, measuring $\frac{3}{4}$ of an inch thick, diagonally across the root of the bar, what length is required for the ring? In table 14, page 84, opposite the given diameter, is 9 ft. $0\frac{3}{8}$ in. the length required.

TABLE X.

For Angle Iron measuring $\frac{1}{4}$ of an Inch thick, diagonally across the root.

FLANGE INSIDE.

OUTSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.		OUTSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.		OUTSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.		OUTSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.	
FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN	FT.	IN.	FT.	IN.	FT.	IN
0	6	1	5¼	0	10	2	5⅞	1	2	3	6⅜	1	6	4	7
0	6⅛	1	5⅝	0	10⅛	2	6¼	1	2⅛	3	6¾	1	6⅛	4	7⅜
0	6¼	1	6	0	10¼	2	6⅝	1	2¼	3	7⅛	1	6¼	4	7¾
0	6⅜	1	6½	0	10⅜	2	7	1	2⅜	3	7⅝	1	6⅜	4	8⅛
0	6½	1	6¾	0	10½	2	7⅜	1	2½	3	8	1	6½	4	8½
0	6⅝	1	7¼	0	10⅝	2	7¾	1	2⅝	3	8⅜	1	6⅝	4	8⅞
0	6¾	1	7⅝	0	10¾	2	8¼	1	2¾	3	8¾	1	6¾	4	9¼
0	6⅞	1	8	0	10⅞	2	8⅝	1	2⅞	3	9⅛	1	6⅞	4	9⅝
0	7	1	8⅜	0	11	2	9	1	3	3	9½	1	7	4	10⅛
0	7⅛	1	8¾	0	11⅛	2	9⅜	1	3⅛	3	9⅞	1	7⅛	4	10½
0	7¼	1	9⅛	0	11¼	2	9¾	1	3¼	3	10⅜	1	7¼	4	10⅞
0	7⅜	1	9½	0	11⅜	2	10⅛	1	3⅜	3	10¾	1	7⅜	4	11¼
0	7½	1	10	0	11½	2	10½	1	3½	3	11⅛	1	7½	4	11⅝
0	7⅝	1	10⅜	0	11⅝	2	10⅞	1	3⅝	3	11½	1	7⅝	5	0
0	7¾	1	10¾	0	11¾	2	11⅜	1	3¾	3	11⅞	1	7¾	5	0⅜
0	7⅞	1	11⅛	0	11⅞	2	11¾	1	3⅞	4	0¼	1	7⅞	5	0⅞
0	8	1	11½	1	0	3	0⅛	1	4	4	0⅝	1	8	5	1¼
0	8⅛	1	11⅞	1	0⅛	3	0½	1	4⅛	4	1	1	8⅛	5	1⅝
0	8¼	2	0⅜	1	0¼	3	0⅞	1	4¼	4	1⅜	1	8¼	5	2
0	8⅜	2	0¾	1	0⅜	3	1¼	1	4⅜	4	1⅞	1	8⅜	5	2⅜
0	8½	2	1⅛	1	0½	3	1⅝	1	4½	4	2¼	1	8½	5	2¾
0	8⅝	2	1½	1	0⅝	3	2	1	4⅝	4	2⅝	1	8⅝	5	3⅛
0	8¾	2	1⅞	1	0¾	3	2½	1	4¾	4	3	1	8¾	5	3⅝
0	8⅞	2	2⅜	1	0⅞	3	2⅞	1	4⅞	4	3⅜	1	8⅞	5	4
0	9	2	2¾	1	1	3	3¼	1	5	4	3¾	1	9	5	4⅜
0	9⅛	2	3⅛	1	1⅛	3	3⅝	1	5⅛	4	4⅛	1	9⅛	5	4¾
0	9¼	2	3½	1	1¼	3	4	1	5¼	4	4½	1	9¼	5	5⅛
0	9⅜	2	3⅞	1	1⅜	3	4⅜	1	5⅜	4	5	1	9⅜	5	5½
0	9½	2	4¼	1	1½	3	4⅞	1	5½	4	5⅜	1	9½	5	5⅞
0	9⅝	2	4⅝	1	1⅝	3	5¼	1	5⅝	4	5¾	1	9⅝	5	6⅜
0	9¾	2	5	1	1¾	3	5⅝	1	5¾	4	6⅛	1	9¾	5	6¾
0	9⅞	2	5½	1	1⅞	3	6	1	5⅞	4	6½	1	9⅞	5	7⅛

For Angle Iron measuring $\frac{1}{4}$ of an Inch thick, diagonally across the root.

FLANGE INSIDE.

OUTSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.		OUTSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.		OUTSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.		OUTSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.	
FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN
1	10	5	$7\frac{1}{2}$	2	2	6	$8\frac{1}{8}$	2	6	7	$8\frac{5}{8}$	2	10	8	$9\frac{1}{4}$
1	$10\frac{1}{8}$	5	8	2	$2\frac{1}{8}$	6	$8\frac{1}{2}$	2	$6\frac{1}{8}$	7	9	2	$10\frac{1}{8}$	8	$9\frac{5}{8}$
1	$10\frac{1}{4}$	5	$8\frac{3}{8}$	2	$2\frac{1}{4}$	6	$8\frac{7}{8}$	2	$6\frac{1}{4}$	7	$9\frac{3}{8}$	2	$10\frac{1}{4}$	8	10
1	$10\frac{3}{8}$	5	$8\frac{3}{4}$	2	$2\frac{3}{8}$	6	$9\frac{1}{4}$	2	$6\frac{3}{8}$	7	$9\frac{3}{4}$	2	$10\frac{3}{8}$	8	$10\frac{3}{8}$
1	$10\frac{1}{2}$	5	$9\frac{1}{8}$	2	$2\frac{1}{2}$	6	$9\frac{5}{8}$	2	$6\frac{1}{2}$	7	$10\frac{1}{4}$	2	$10\frac{1}{2}$	8	$10\frac{3}{4}$
1	$10\frac{5}{8}$	5	$9\frac{1}{2}$	2	$2\frac{5}{8}$	6	10	2	$6\frac{5}{8}$	7	$10\frac{5}{8}$	2	$10\frac{5}{8}$	8	$11\frac{1}{8}$
1	$10\frac{3}{4}$	5	$9\frac{7}{8}$	2	$2\frac{3}{4}$	6	$10\frac{1}{2}$	2	$6\frac{3}{4}$	7	11	2	$10\frac{3}{4}$	8	$11\frac{1}{2}$
1	$10\frac{7}{8}$	5	$10\frac{1}{4}$	2	$2\frac{7}{8}$	6	$10\frac{7}{8}$	2	$6\frac{7}{8}$	7	$11\frac{3}{8}$	2	$10\frac{7}{8}$	9	0
1	11	5	$10\frac{5}{8}$	2	3	6	$11\frac{1}{4}$	2	7	7	$11\frac{3}{4}$	2	11	9	$0\frac{3}{8}$
1	$11\frac{1}{8}$	5	11	2	$3\frac{1}{8}$	6	$11\frac{5}{8}$	2	$7\frac{1}{8}$	8	$0\frac{1}{8}$	2	$11\frac{1}{8}$	9	$0\frac{3}{4}$
1	$11\frac{1}{4}$	5	$11\frac{1}{2}$	2	$3\frac{1}{4}$	7	0	2	$7\frac{1}{4}$	8	$0\frac{1}{2}$	2	$11\frac{1}{4}$	9	$1\frac{1}{8}$
1	$11\frac{3}{8}$	5	$11\frac{7}{8}$	2	$3\frac{3}{8}$	7	$0\frac{3}{8}$	2	$7\frac{3}{8}$	8	1	2	$11\frac{3}{8}$	9	$1\frac{1}{2}$
1	$11\frac{1}{2}$	6	$0\frac{1}{4}$	2	$3\frac{1}{2}$	7	$0\frac{3}{4}$	2	$7\frac{1}{2}$	8	$1\frac{3}{8}$	2	$11\frac{1}{2}$	9	$1\frac{7}{8}$
1	$11\frac{5}{8}$	6	$0\frac{5}{8}$	2	$3\frac{5}{8}$	7	$1\frac{1}{8}$	2	$7\frac{5}{8}$	8	$1\frac{3}{4}$	2	$11\frac{5}{8}$	9	$2\frac{3}{8}$
1	$11\frac{3}{4}$	6	1	2	$3\frac{3}{4}$	7	$1\frac{1}{2}$	2	$7\frac{3}{4}$	8	$2\frac{1}{8}$	2	$11\frac{3}{4}$	9	$2\frac{3}{4}$
1	$11\frac{7}{8}$	6	$1\frac{3}{8}$	2	$3\frac{7}{8}$	7	2	2	$7\frac{7}{8}$	8	$2\frac{1}{2}$	2	$11\frac{7}{8}$	9	$3\frac{1}{8}$
2	0	6	$1\frac{3}{4}$	2	4	7	$2\frac{3}{8}$	2	8	8	$2\frac{7}{8}$	3	0	9	$3\frac{1}{2}$
2	$0\frac{1}{8}$	6	$2\frac{1}{4}$	2	$4\frac{1}{8}$	7	$2\frac{3}{4}$	2	$8\frac{1}{8}$	8	$3\frac{3}{8}$	3	$0\frac{1}{8}$	9	$3\frac{7}{8}$
2	$0\frac{1}{4}$	6	$2\frac{5}{8}$	2	$4\frac{1}{4}$	7	$3\frac{1}{8}$	2	$8\frac{1}{4}$	8	$3\frac{3}{4}$	3	$0\frac{1}{4}$	9	$4\frac{1}{4}$
2	$0\frac{3}{8}$	6	3	2	$4\frac{3}{8}$	7	$3\frac{1}{2}$	2	$8\frac{3}{8}$	8	$4\frac{1}{8}$	3	$0\frac{3}{8}$	9	$4\frac{5}{8}$
2	$0\frac{1}{2}$	6	$3\frac{3}{8}$	2	$4\frac{1}{2}$	7	$3\frac{7}{8}$	2	$8\frac{1}{2}$	8	$4\frac{1}{2}$	3	$0\frac{1}{2}$	9	5
2	$0\frac{5}{8}$	6	$3\frac{3}{4}$	2	$4\frac{5}{8}$	7	$4\frac{3}{8}$	2	$8\frac{5}{8}$	8	$4\frac{7}{8}$	3	$0\frac{5}{8}$	9	$5\frac{1}{2}$
2	$0\frac{3}{4}$	6	$4\frac{1}{8}$	2	$4\frac{3}{4}$	7	$4\frac{3}{4}$	2	$8\frac{3}{4}$	8	$5\frac{1}{4}$	3	$0\frac{3}{4}$	9	$5\frac{7}{8}$
2	$0\frac{7}{8}$	6	$4\frac{1}{2}$	2	$4\frac{7}{8}$	7	$5\frac{1}{8}$	2	$8\frac{7}{8}$	8	$5\frac{5}{8}$	3	$0\frac{7}{8}$	9	$6\frac{1}{4}$
2	1	6	$4\frac{7}{8}$	2	5	7	$5\frac{1}{2}$	2	9	8	6	3	1	9	$6\frac{5}{8}$
2	$1\frac{1}{8}$	6	$5\frac{3}{8}$	2	$5\frac{1}{8}$	7	$5\frac{7}{8}$	2	$9\frac{1}{8}$	8	$6\frac{1}{2}$	3	$1\frac{1}{8}$	9	7
2	$1\frac{1}{4}$	6	$5\frac{3}{4}$	2	$5\frac{1}{4}$	7	$6\frac{1}{4}$	2	$9\frac{1}{4}$	8	$6\frac{7}{8}$	3	$1\frac{1}{4}$	9	$7\frac{3}{8}$
2	$1\frac{3}{8}$	6	$6\frac{1}{8}$	2	$5\frac{3}{8}$	7	$6\frac{5}{8}$	2	$9\frac{3}{8}$	8	$7\frac{1}{4}$	3	$1\frac{3}{8}$	9	$7\frac{7}{8}$
2	$1\frac{1}{2}$	6	$6\frac{1}{2}$	2	$5\frac{1}{2}$	7	7	2	$9\frac{1}{2}$	8	$7\frac{5}{8}$	3	$1\frac{1}{2}$	9	$8\frac{1}{4}$
2	$1\frac{5}{8}$	6	$6\frac{7}{8}$	2	$5\frac{5}{8}$	7	$7\frac{1}{2}$	2	$9\frac{5}{8}$	8	8	3	$1\frac{5}{8}$	9	$8\frac{5}{8}$
2	$1\frac{3}{4}$	6	$7\frac{1}{4}$	2	$5\frac{3}{4}$	7	$7\frac{7}{8}$	2	$9\frac{3}{4}$	8	$8\frac{3}{8}$	3	$1\frac{3}{4}$	9	9
2	$1\frac{7}{8}$	6	$7\frac{5}{8}$	2	$5\frac{7}{8}$	7	$8\frac{1}{4}$	2	$9\frac{7}{8}$	8	$8\frac{7}{8}$	3	$1\frac{7}{8}$	9	$9\frac{3}{8}$

For ANGLE IRON measuring $\frac{1}{4}$ of an Inch thick, diagonally across the root.

FLANGE INSIDE.

OUTSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.		OUTSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.		OUTSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.		OUTSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.	
FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.
3	2	9	9¾	3	6	10	10⅜	3	10	11	10⅞	4	2	12	11½
3	2⅛	9	10⅛	3	6⅛	10	10¾	3	10⅛	11	11¼	4	2⅛	12	11⅞
3	2¼	9	10½	3	6¼	10	11⅛	3	10¼	11	11⅝	4	2¼	13	0¼
3	2⅜	9	10⅞	3	6⅜	10	11½	3	10⅜	12	0⅛	4	2⅜	13	0⅝
3	2½	9	11⅜	3	6½	10	11⅞	3	10½	12	0½	4	2½	13	1
3	2⅝	9	11¾	3	6⅝	11	0⅜	3	10⅝	12	0⅞	4	2⅝	13	1½
3	2¾	10	0⅛	3	6¾	11	0¾	3	10¾	12	1¼	4	2¾	13	1⅞
3	2⅞	10	0½	3	6⅞	11	1⅛	3	10⅞	12	1⅝	4	2⅞	13	2¼
3	3	10	0⅞	3	7	11	1½	3	11	12	2	4	3	13	2⅝
3	3⅛	10	1⅜	3	7⅛	11	1⅞	3	11⅛	12	2⅜	4	3⅛	13	3
3	3¼	10	1¾	3	7¼	11	2¼	3	11¼	12	2⅞	4	3¼	13	3⅜
3	3⅜	10	2⅛	3	7⅜	11	2⅝	3	11⅜	12	3¼	4	3⅜	13	3¾
3	3½	10	2½	3	7½	11	3	3	11½	12	3⅝	4	3½	13	4¼
3	3⅝	10	2⅞	3	7⅝	11	3½	3	11⅝	12	4	4	3⅝	13	4⅝
3	3¾	10	3¼	3	7¾	11	3⅞	3	11¾	12	4⅜	4	3¾	13	5
3	3⅞	10	3⅝	3	7⅞	11	4¼	3	11⅞	12	4¾	4	3⅞	13	5⅜
3	4	10	4	3	8	11	4⅝	4	0	12	5¼	4	4	13	5¾
3	4⅛	10	4½	3	8⅛	11	5	4	0⅛	12	5⅝	4	4⅛	13	6⅛
3	4¼	10	4⅞	3	8¼	11	5⅜	4	0¼	12	6	4	4¼	13	6½
3	4⅜	10	5¼	3	8⅜	11	5¾	4	0⅜	12	6⅜	4	4⅜	13	7
3	4½	10	5⅝	3	8½	11	6¼	4	0½	12	6¾	4	4½	13	7⅜
3	4⅝	10	6	3	8⅝	11	6⅝	4	0⅝	12	7⅛	4	4⅝	13	7¾
3	4¾	10	6⅜	3	8¾	11	7	4	0¾	12	7½	4	4¾	13	8⅛
3	4⅞	10	6⅞	3	8⅞	11	7⅜	4	0⅞	12	7⅞	4	4⅞	13	8½
3	5	10	7¼	3	9	11	7¾	4	1	12	8⅜	4	5	13	8⅞
3	5⅛	10	7⅝	3	9⅛	11	8⅛	4	1⅛	12	8¾	4	5⅛	13	9¼
3	5¼	10	8	3	9¼	11	8½	4	1¼	12	9⅛	4	5¼	13	9⅝
3	5⅜	10	8⅜	3	9⅜	11	8⅞	4	1⅜	12	9½	4	5⅜	13	10⅛
3	5½	10	8¾	3	9½	11	9⅜	4	1½	12	9⅞	4	5½	13	10½
3	5⅝	10	9¼	3	9⅝	11	9¾	4	1⅝	12	10⅜	4	5⅝	13	10⅞
3	5¾	10	9½	3	9¾	11	10⅛	4	1¾	12	10¾	4	5¾	13	11¼
3	5⅞	10	9⅞	3	9⅞	11	10½	4	1⅞	12	11⅛	4	5⅞	13	11⅝

For ANGLE IRON measuring $\frac{1}{4}$ of an Inch thick, diagonally across the root.

FLANGE INSIDE.

OUTSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.		OUTSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.		OUTSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.		OUTSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.	
FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN
4	6	14	0	4	10	15	$0\frac{5}{8}$	5	2	16	$1\frac{1}{8}$	5	6	17	$1\frac{3}{4}$
4	$6\frac{1}{8}$	14	$0\frac{3}{8}$	4	$10\frac{1}{8}$	15	1	5	$2\frac{1}{8}$	16	$1\frac{5}{8}$	5	$6\frac{1}{8}$	17	$2\frac{1}{8}$
4	$6\frac{1}{4}$	14	$0\frac{7}{8}$	4	$10\frac{1}{4}$	15	$1\frac{3}{8}$	5	$2\frac{1}{4}$	16	2	5	$6\frac{1}{4}$	17	$2\frac{1}{2}$
4	$6\frac{3}{8}$	14	$1\frac{1}{4}$	4	$10\frac{3}{8}$	15	$1\frac{7}{8}$	5	$2\frac{3}{8}$	16	$2\frac{3}{8}$	5	$6\frac{3}{8}$	17	$2\frac{7}{8}$
4	$6\frac{1}{2}$	14	$1\frac{5}{8}$	4	$10\frac{1}{2}$	15	$2\frac{1}{4}$	5	$2\frac{1}{2}$	16	$2\frac{3}{4}$	5	$6\frac{1}{2}$	17	$3\frac{3}{8}$
4	$6\frac{5}{8}$	14	2	4	$10\frac{5}{8}$	15	$2\frac{5}{8}$	5	$2\frac{5}{8}$	16	$3\frac{1}{8}$	5	$6\frac{5}{8}$	17	$3\frac{3}{4}$
4	$6\frac{3}{4}$	14	$2\frac{3}{8}$	4	$10\frac{3}{4}$	15	3	5	$2\frac{3}{4}$	16	$3\frac{1}{2}$	5	$6\frac{3}{4}$	17	$4\frac{1}{8}$
4	$6\frac{7}{8}$	14	$2\frac{3}{4}$	4	$10\frac{7}{8}$	15	$3\frac{3}{8}$	5	$2\frac{7}{8}$	16	$3\frac{7}{8}$	5	$6\frac{7}{8}$	17	$4\frac{1}{2}$
4	7	14	$3\frac{1}{8}$	4	11	15	$3\frac{3}{4}$	5	3	16	$4\frac{3}{8}$	5	7	17	$4\frac{7}{8}$
4	$7\frac{1}{8}$	14	$3\frac{1}{2}$	4	$11\frac{1}{8}$	15	$4\frac{1}{8}$	5	$3\frac{1}{8}$	16	$4\frac{3}{4}$	5	$7\frac{1}{8}$	17	$5\frac{1}{4}$
4	$7\frac{1}{4}$	14	4	4	$11\frac{1}{4}$	15	$4\frac{1}{2}$	5	$3\frac{1}{4}$	16	$5\frac{1}{8}$	5	$7\frac{1}{4}$	17	$5\frac{5}{8}$
4	$7\frac{3}{8}$	14	$4\frac{3}{8}$	4	$11\frac{3}{8}$	15	$4\frac{7}{8}$	5	$3\frac{3}{8}$	16	$5\frac{1}{2}$	5	$7\frac{3}{8}$	17	6
4	$7\frac{1}{2}$	14	$4\frac{3}{4}$	4	$11\frac{1}{2}$	15	$5\frac{3}{8}$	5	$3\frac{1}{2}$	16	$5\frac{7}{8}$	5	$7\frac{1}{2}$	17	$6\frac{1}{2}$
4	$7\frac{5}{8}$	14	$5\frac{1}{8}$	4	$11\frac{5}{8}$	15	$5\frac{3}{4}$	5	$3\frac{5}{8}$	16	$6\frac{1}{4}$	5	$7\frac{5}{8}$	17	$6\frac{7}{8}$
4	$7\frac{3}{4}$	14	$5\frac{1}{2}$	4	$11\frac{3}{4}$	15	$6\frac{1}{8}$	5	$3\frac{3}{4}$	16	$6\frac{3}{8}$	5	$7\frac{3}{4}$	17	$7\frac{1}{4}$
4	$7\frac{7}{8}$	14	$5\frac{7}{8}$	4	$11\frac{7}{8}$	15	$6\frac{1}{2}$	5	$3\frac{7}{8}$	16	7	5	$7\frac{7}{8}$	17	$7\frac{5}{8}$
4	8	14	$6\frac{3}{8}$	5	0	15	$6\frac{7}{8}$	5	4	16	$7\frac{1}{2}$	5	8	17	8
4	$8\frac{1}{8}$	14	$6\frac{3}{4}$	5	$0\frac{1}{8}$	15	$7\frac{1}{4}$	5	$4\frac{1}{8}$	16	$7\frac{7}{8}$	5	$8\frac{1}{8}$	17	$8\frac{3}{8}$
4	$8\frac{1}{4}$	14	$7\frac{1}{8}$	5	$0\frac{1}{4}$	15	$7\frac{3}{4}$	5	$4\frac{1}{4}$	16	$8\frac{1}{4}$	5	$8\frac{1}{4}$	17	$8\frac{7}{8}$
4	$8\frac{3}{8}$	14	$7\frac{1}{2}$	5	$0\frac{3}{8}$	15	$8\frac{1}{8}$	5	$4\frac{3}{8}$	16	$8\frac{5}{8}$	5	$8\frac{3}{8}$	17	$9\frac{1}{4}$
4	$8\frac{1}{2}$	14	$7\frac{7}{8}$	5	$0\frac{1}{2}$	15	$8\frac{1}{2}$	5	$4\frac{1}{2}$	16	9	5	$8\frac{1}{2}$	17	$9\frac{5}{8}$
4	$8\frac{5}{8}$	14	$8\frac{1}{4}$	5	$0\frac{5}{8}$	15	$8\frac{7}{8}$	5	$4\frac{5}{8}$	16	$9\frac{3}{8}$	5	$8\frac{5}{8}$	17	10
4	$8\frac{3}{4}$	14	$8\frac{3}{4}$	5	$0\frac{3}{4}$	15	$9\frac{1}{4}$	5	$4\frac{3}{4}$	16	$9\frac{7}{8}$	5	$8\frac{3}{4}$	17	$10\frac{3}{8}$
4	$8\frac{7}{8}$	14	$9\frac{1}{8}$	5	$0\frac{7}{8}$	15	$9\frac{5}{8}$	5	$4\frac{7}{8}$	16	$10\frac{1}{4}$	5	$8\frac{7}{8}$	17	$10\frac{3}{4}$
4	9	14	$9\frac{1}{2}$	5	1	15	10	5	5	16	$10\frac{5}{8}$	5	9	17	$11\frac{1}{8}$
4	$9\frac{1}{8}$	14	$9\frac{7}{8}$	5	$1\frac{1}{8}$	15	$10\frac{3}{8}$	5	$5\frac{1}{8}$	16	11	5	$9\frac{1}{8}$	17	$11\frac{1}{2}$
4	$9\frac{1}{4}$	14	$10\frac{1}{4}$	5	$1\frac{1}{4}$	15	$10\frac{7}{8}$	5	$5\frac{1}{4}$	16	$11\frac{3}{8}$	5	$9\frac{1}{4}$	18	0
4	$9\frac{3}{8}$	14	$10\frac{5}{8}$	5	$1\frac{3}{8}$	15	$11\frac{1}{4}$	5	$5\frac{3}{8}$	16	$11\frac{3}{4}$	5	$9\frac{3}{8}$	18	$0\frac{3}{8}$
4	$9\frac{1}{2}$	14	11	5	$1\frac{1}{2}$	15	$11\frac{5}{8}$	5	$5\frac{1}{2}$	17	$0\frac{1}{8}$	5	$9\frac{1}{2}$	18	$0\frac{3}{4}$
4	$9\frac{5}{8}$	14	$11\frac{1}{2}$	5	$1\frac{5}{8}$	16	0	5	$5\frac{5}{8}$	17	$0\frac{5}{8}$	5	$9\frac{5}{8}$	18	$1\frac{1}{8}$
4	$9\frac{3}{4}$	14	$11\frac{7}{8}$	5	$1\frac{3}{4}$	16	$0\frac{3}{8}$	5	$5\frac{3}{4}$	17	1	5	$9\frac{3}{4}$	18	$1\frac{1}{2}$
4	$9\frac{7}{8}$	15	$0\frac{1}{4}$	5	$1\frac{7}{8}$	16	$0\frac{3}{4}$	5	$5\frac{7}{8}$	17	$1\frac{3}{8}$	5	$9\frac{7}{8}$	18	$1\frac{7}{8}$

For Angle Iron measuring $\frac{1}{4}$ of an Inch thick, diagonally across the root.

FLANGE INSIDE.

OUTSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.		OUTSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.		OUTSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.		OUTSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.	
FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN
5	10	18	$2\frac{3}{8}$	6	2	19	$2\frac{7}{8}$	6	6	20	$3\frac{1}{2}$	6	10	21	4
5	$10\frac{1}{8}$	18	$2\frac{3}{4}$	6	$2\frac{1}{8}$	19	$3\frac{1}{4}$	6	$6\frac{1}{8}$	20	$3\frac{7}{8}$	6	$10\frac{1}{8}$	21	$4\frac{3}{8}$
5	$10\frac{1}{4}$	18	$3\frac{1}{8}$	6	$2\frac{1}{4}$	19	$3\frac{5}{8}$	6	$6\frac{1}{4}$	20	$4\frac{1}{4}$	6	$10\frac{1}{4}$	21	$4\frac{3}{4}$
5	$10\frac{3}{8}$	18	$3\frac{1}{2}$	6	$2\frac{3}{8}$	19	4	6	$6\frac{3}{8}$	20	$4\frac{5}{8}$	6	$10\frac{3}{8}$	21	$5\frac{1}{8}$
5	$10\frac{1}{2}$	18	$3\frac{7}{8}$	6	$2\frac{1}{2}$	19	$4\frac{1}{2}$	6	$6\frac{1}{2}$	20	5	6	$10\frac{1}{2}$	21	$5\frac{1}{2}$
5	$10\frac{5}{8}$	18	$4\frac{1}{4}$	6	$2\frac{5}{8}$	19	$4\frac{7}{8}$	6	$6\frac{3}{8}$	20	$5\frac{3}{8}$	6	$10\frac{5}{8}$	21	6
5	$10\frac{3}{4}$	18	$4\frac{5}{8}$	6	$2\frac{3}{4}$	19	$5\frac{1}{4}$	6	$6\frac{3}{4}$	20	$5\frac{7}{8}$	6	$10\frac{3}{4}$	21	$6\frac{3}{8}$
5	$10\frac{7}{8}$	18	5	6	$2\frac{7}{8}$	19	$5\frac{5}{8}$	6	$6\frac{7}{8}$	20	$6\frac{1}{4}$	6	$10\frac{7}{8}$	21	$6\frac{3}{4}$
5	11	18	$5\frac{1}{2}$	6	3	19	6	6	7	20	$6\frac{5}{8}$	6	11	21	$7\frac{1}{8}$
5	$11\frac{1}{8}$	18	$5\frac{7}{8}$	6	$3\frac{1}{8}$	19	$6\frac{3}{8}$	6	$7\frac{1}{8}$	20	7	6	$11\frac{1}{8}$	21	$7\frac{5}{8}$
5	$11\frac{1}{4}$	18	$6\frac{1}{4}$	6	$3\frac{1}{4}$	19	$6\frac{7}{8}$	6	$7\frac{1}{4}$	20	$7\frac{3}{8}$	6	$11\frac{1}{4}$	21	8
5	$11\frac{3}{8}$	18	$6\frac{5}{8}$	6	$3\frac{3}{8}$	19	$7\frac{1}{4}$	6	$7\frac{3}{8}$	20	$7\frac{3}{4}$	6	$11\frac{3}{8}$	21	$8\frac{3}{8}$
5	$11\frac{1}{2}$	18	7	6	$3\frac{1}{2}$	19	$7\frac{5}{8}$	6	$7\frac{1}{2}$	20	$8\frac{1}{8}$	6	$11\frac{1}{2}$	21	$8\frac{3}{4}$
5	$11\frac{5}{8}$	18	$7\frac{3}{8}$	6	$3\frac{5}{8}$	19	8	6	$7\frac{5}{8}$	20	$8\frac{1}{2}$	6	$11\frac{5}{8}$	21	$9\frac{1}{8}$
5	$11\frac{3}{4}$	18	$7\frac{7}{8}$	6	$3\frac{3}{4}$	19	$8\frac{3}{8}$	6	$7\frac{3}{4}$	20	9	6	$11\frac{3}{4}$	21	$9\frac{1}{2}$
5	$11\frac{7}{8}$	18	$8\frac{1}{4}$	6	$3\frac{7}{8}$	19	$8\frac{3}{4}$	6	$7\frac{7}{8}$	20	$9\frac{3}{8}$	6	$11\frac{7}{8}$	21	$9\frac{7}{8}$
6	0	18	$8\frac{5}{8}$	6	4	19	$9\frac{1}{8}$	6	8	20	$9\frac{3}{4}$	7	0	21	$10\frac{3}{8}$
6	$0\frac{1}{8}$	18	9	6	$4\frac{1}{8}$	19	$9\frac{5}{8}$	6	$8\frac{1}{8}$	20	$10\frac{1}{8}$	7	$0\frac{1}{8}$	21	$10\frac{3}{4}$
6	$0\frac{1}{4}$	18	$9\frac{3}{8}$	6	$4\frac{1}{4}$	19	10	6	$8\frac{1}{4}$	20	$10\frac{1}{2}$	7	$0\frac{1}{4}$	21	$11\frac{1}{8}$
6	$0\frac{3}{8}$	18	$9\frac{3}{4}$	6	$4\frac{3}{8}$	19	$10\frac{3}{8}$	6	$8\frac{3}{8}$	20	$10\frac{7}{8}$	7	$0\frac{3}{8}$	21	$11\frac{1}{2}$
6	$0\frac{1}{2}$	18	$10\frac{1}{8}$	6	$4\frac{1}{2}$	19	$10\frac{3}{4}$	6	$8\frac{1}{2}$	20	$11\frac{3}{8}$	7	$0\frac{1}{2}$	21	$11\frac{7}{8}$
6	$0\frac{5}{8}$	18	$10\frac{1}{2}$	6	$4\frac{5}{8}$	19	$11\frac{1}{8}$	6	$8\frac{5}{8}$	20	$11\frac{3}{4}$	7	$0\frac{5}{8}$	22	$0\frac{1}{4}$
6	$0\frac{3}{4}$	18	11	6	$4\frac{3}{4}$	19	$11\frac{1}{2}$	6	$8\frac{3}{4}$	21	$0\frac{1}{8}$	7	$0\frac{3}{4}$	22	$0\frac{5}{8}$
6	$0\frac{7}{8}$	18	$11\frac{3}{8}$	6	$4\frac{7}{8}$	19	$11\frac{7}{8}$	6	$8\frac{7}{8}$	21	$0\frac{1}{2}$	7	$0\frac{7}{8}$	22	1
6	1	18	$11\frac{3}{4}$	6	5	20	$0\frac{3}{8}$	6	9	21	$0\frac{7}{8}$	7	1	22	$1\frac{1}{2}$
6	$1\frac{1}{8}$	19	$0\frac{1}{8}$	6	$5\frac{1}{8}$	20	$0\frac{3}{4}$	6	$9\frac{1}{8}$	21	$1\frac{1}{4}$	7	$1\frac{1}{8}$	22	$1\frac{7}{8}$
6	$1\frac{1}{4}$	19	$0\frac{1}{2}$	6	$5\frac{1}{4}$	20	$1\frac{1}{8}$	6	$9\frac{1}{4}$	21	$1\frac{5}{8}$	7	$1\frac{1}{4}$	22	$2\frac{1}{4}$
6	$1\frac{3}{8}$	19	$0\frac{7}{8}$	6	$5\frac{3}{8}$	20	$1\frac{1}{2}$	6	$9\frac{3}{8}$	21	2	7	$1\frac{3}{8}$	22	$2\frac{5}{8}$
6	$1\frac{1}{2}$	19	$1\frac{3}{8}$	6	$5\frac{1}{2}$	20	$1\frac{7}{8}$	6	$9\frac{1}{2}$	21	$2\frac{1}{2}$	7	$1\frac{1}{2}$	22	3
6	$1\frac{5}{8}$	19	$1\frac{3}{4}$	6	$5\frac{5}{8}$	20	$2\frac{1}{4}$	6	$9\frac{5}{8}$	21	$2\frac{7}{8}$	7	$1\frac{5}{8}$	22	$3\frac{3}{8}$
6	$1\frac{3}{4}$	19	$2\frac{1}{8}$	6	$5\frac{3}{4}$	20	$2\frac{5}{8}$	6	$9\frac{3}{4}$	21	$3\frac{1}{4}$	7	$1\frac{3}{4}$	22	$3\frac{7}{8}$
6	$1\frac{7}{8}$	19	$2\frac{1}{2}$	6	$5\frac{7}{8}$	20	3	6	$9\frac{7}{8}$	21	$3\frac{5}{8}$	7	$1\frac{7}{8}$	22	$4\frac{1}{4}$

For Angle Iron measuring $\frac{1}{4}$ of an Inch thick, diagonally across the root.

FLANGE INSIDE.

OUTSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.		OUTSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.		OUTSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.		OUTSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.	
FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN
7	2	22	$4\frac{5}{8}$	7	6	23	$5\frac{1}{8}$	7	10	24	$5\frac{3}{4}$	8	2	25	$6\frac{1}{4}$
7	$2\frac{1}{8}$	22	5	7	$6\frac{1}{8}$	23	$5\frac{1}{2}$	7	$10\frac{1}{8}$	24	$6\frac{1}{8}$	8	$2\frac{1}{8}$	25	$6\frac{5}{8}$
7	$2\frac{1}{4}$	22	$5\frac{3}{8}$	7	$6\frac{1}{4}$	23	6	7	$10\frac{1}{4}$	24	$6\frac{1}{2}$	8	$2\frac{1}{4}$	25	7
7	$2\frac{3}{8}$	22	$5\frac{3}{4}$	7	$6\frac{3}{8}$	23	$6\frac{3}{8}$	7	$10\frac{3}{8}$	24	$6\frac{7}{8}$	8	$2\frac{3}{8}$	25	$7\frac{1}{2}$
7	$2\frac{1}{2}$	22	$6\frac{1}{8}$	7	$6\frac{1}{2}$	23	$6\frac{3}{4}$	7	$10\frac{1}{2}$	24	$7\frac{1}{4}$	8	$2\frac{1}{2}$	25	$7\frac{7}{8}$
7	$2\frac{5}{8}$	22	$6\frac{1}{2}$	7	$6\frac{5}{8}$	23	$7\frac{1}{8}$	7	$10\frac{5}{8}$	24	$7\frac{5}{8}$	8	$2\frac{5}{8}$	25	$8\frac{1}{4}$
7	$2\frac{3}{4}$	22	7	7	$6\frac{3}{4}$	23	$7\frac{1}{2}$	7	$10\frac{3}{4}$	24	8	8	$2\frac{3}{4}$	25	$8\frac{5}{8}$
7	$2\frac{7}{8}$	22	$7\frac{3}{8}$	7	$6\frac{7}{8}$	23	$7\frac{7}{8}$	7	$10\frac{7}{8}$	24	$8\frac{1}{2}$	8	$2\frac{7}{8}$	25	9
7	3	22	$7\frac{3}{4}$	7	7	23	$8\frac{1}{4}$	7	11	24	$8\frac{7}{8}$	8	3	25	$9\frac{1}{2}$
7	$3\frac{1}{8}$	22	$8\frac{1}{8}$	7	$7\frac{1}{8}$	23	$8\frac{3}{4}$	7	$11\frac{1}{8}$	24	$9\frac{1}{4}$	8	$3\frac{1}{8}$	25	$9\frac{7}{8}$
7	$3\frac{1}{4}$	22	$8\frac{1}{2}$	7	$7\frac{1}{4}$	23	$9\frac{1}{8}$	7	$11\frac{1}{4}$	24	$9\frac{5}{8}$	8	$3\frac{1}{4}$	25	$10\frac{1}{4}$
7	$3\frac{3}{8}$	22	$8\frac{7}{8}$	7	$7\frac{3}{8}$	23	$9\frac{1}{2}$	7	$11\frac{3}{8}$	24	10	8	$3\frac{3}{8}$	25	$10\frac{5}{8}$
7	$3\frac{1}{2}$	22	$9\frac{1}{4}$	7	$7\frac{1}{2}$	23	$9\frac{7}{8}$	7	$11\frac{1}{2}$	24	$10\frac{1}{2}$	8	$3\frac{1}{2}$	25	11
7	$3\frac{5}{8}$	22	$9\frac{3}{4}$	7	$7\frac{5}{8}$	23	$10\frac{1}{4}$	7	$11\frac{5}{8}$	24	$10\frac{7}{8}$	8	$3\frac{5}{8}$	25	$11\frac{3}{8}$
7	$3\frac{3}{4}$	22	$10\frac{1}{8}$	7	$7\frac{3}{4}$	23	$10\frac{5}{8}$	7	$11\frac{3}{4}$	24	$11\frac{1}{4}$	8	$3\frac{3}{4}$	25	$11\frac{3}{4}$
7	$3\frac{7}{8}$	22	$10\frac{1}{2}$	7	$7\frac{7}{8}$	23	11	7	$11\frac{7}{8}$	24	$11\frac{5}{8}$	8	$3\frac{7}{8}$	26	$0\frac{1}{8}$
7	4	22	$10\frac{7}{8}$	7	8	23	$11\frac{1}{2}$	8	0	25	0	8	4	26	$0\frac{5}{8}$
7	$4\frac{1}{8}$	22	$11\frac{1}{4}$	7	$8\frac{1}{8}$	23	$11\frac{7}{8}$	8	$0\frac{1}{8}$	25	$0\frac{3}{8}$	8	$4\frac{1}{8}$	26	1
7	$4\frac{1}{4}$	22	$11\frac{5}{8}$	7	$8\frac{1}{4}$	24	$0\frac{1}{4}$	8	$0\frac{1}{4}$	25	$0\frac{3}{4}$	8	$4\frac{1}{4}$	26	$1\frac{3}{8}$
7	$4\frac{3}{8}$	23	0	7	$8\frac{3}{8}$	24	$0\frac{5}{8}$	8	$0\frac{3}{8}$	25	$1\frac{1}{4}$	8	$4\frac{3}{8}$	26	$1\frac{3}{4}$
7	$4\frac{1}{2}$	23	$0\frac{1}{2}$	7	$8\frac{1}{2}$	24	1	8	$0\frac{1}{2}$	25	$1\frac{5}{8}$	8	$4\frac{1}{2}$	26	$2\frac{1}{8}$
7	$4\frac{5}{8}$	23	$0\frac{7}{8}$	7	$8\frac{5}{8}$	24	$1\frac{3}{8}$	8	$0\frac{5}{8}$	25	2	8	$4\frac{5}{8}$	26	$2\frac{1}{2}$
7	$4\frac{3}{4}$	23	$1\frac{1}{4}$	7	$8\frac{3}{4}$	24	$1\frac{3}{4}$	8	$0\frac{3}{4}$	25	$2\frac{3}{8}$	8	$4\frac{3}{4}$	26	$2\frac{7}{8}$
7	$4\frac{7}{8}$	23	$1\frac{5}{8}$	7	$8\frac{7}{8}$	24	$2\frac{1}{4}$	8	$0\frac{7}{8}$	25	$2\frac{3}{4}$	8	$4\frac{7}{8}$	26	$3\frac{3}{8}$
7	5	23	2	7	9	24	$2\frac{5}{8}$	8	1	25	$3\frac{1}{8}$	8	5	26	$3\frac{3}{4}$
7	$5\frac{1}{8}$	23	$2\frac{3}{8}$	7	$9\frac{1}{8}$	24	3	8	$1\frac{1}{8}$	25	$3\frac{1}{2}$	8	$5\frac{1}{8}$	26	$4\frac{1}{8}$
7	$5\frac{1}{4}$	23	$2\frac{3}{4}$	7	$9\frac{1}{4}$	24	$3\frac{3}{8}$	8	$1\frac{1}{4}$	25	$3\frac{7}{8}$	8	$5\frac{1}{4}$	26	$4\frac{1}{2}$
7	$5\frac{3}{8}$	23	$3\frac{1}{4}$	7	$9\frac{3}{8}$	24	$3\frac{3}{4}$	8	$1\frac{3}{8}$	25	$4\frac{3}{8}$	8	$5\frac{3}{8}$	26	$4\frac{7}{8}$
7	$5\frac{1}{2}$	23	$3\frac{5}{8}$	7	$9\frac{1}{2}$	24	$4\frac{1}{8}$	8	$1\frac{1}{2}$	25	$4\frac{3}{4}$	8	$5\frac{1}{2}$	26	$5\frac{1}{4}$
7	$5\frac{5}{8}$	23	4	7	$9\frac{5}{8}$	24	$4\frac{1}{2}$	8	$1\frac{5}{8}$	25	$5\frac{1}{8}$	8	$5\frac{5}{8}$	26	$5\frac{5}{8}$
7	$5\frac{3}{4}$	23	$4\frac{3}{8}$	7	$9\frac{3}{4}$	24	$4\frac{7}{8}$	8	$1\frac{3}{4}$	25	$5\frac{1}{2}$	8	$5\frac{3}{4}$	26	6
7	$5\frac{7}{8}$	23	$4\frac{3}{4}$	7	$9\frac{7}{8}$	24	$5\frac{3}{8}$	8	$1\frac{7}{8}$	25	$5\frac{7}{8}$	8	$5\frac{7}{8}$	26	$6\frac{1}{2}$

TABLE XI.

For Angle Iron measuring $\frac{3}{8}$ of an Inch thick, diagonally across the root.

FLANGE INSIDE.

OUTSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.		OUTSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.		OUTSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.		OUTSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.	
FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.
0	6	1	$4\frac{1}{8}$	0	10	2	5	1	2	3	$5\frac{3}{8}$	1	6	4	$6\frac{1}{8}$
0	$6\frac{1}{8}$	1	$4\frac{7}{8}$	0	$10\frac{1}{8}$	2	$5\frac{1}{2}$	1	$2\frac{1}{8}$	3	6	1	$6\frac{1}{8}$	4	$6\frac{1}{2}$
0	$6\frac{1}{4}$	1	$5\frac{1}{4}$	0	$10\frac{1}{4}$	2	$5\frac{7}{8}$	1	$2\frac{1}{4}$	3	$6\frac{3}{8}$	1	$6\frac{1}{4}$	4	7
0	$6\frac{3}{8}$	1	$5\frac{5}{8}$	0	$10\frac{3}{8}$	2	$6\frac{1}{4}$	1	$2\frac{3}{8}$	3	$6\frac{3}{4}$	1	$6\frac{3}{8}$	4	$7\frac{3}{8}$
0	$6\frac{1}{2}$	1	6	0	$10\frac{1}{2}$	2	$6\frac{5}{8}$	1	$2\frac{1}{2}$	3	$7\frac{1}{4}$	1	$6\frac{1}{2}$	4	$7\frac{3}{4}$
0	$6\frac{5}{8}$	1	$6\frac{1}{2}$	0	$10\frac{5}{8}$	2	7	1	$2\frac{5}{8}$	3	$7\frac{5}{8}$	1	$6\frac{5}{8}$	4	$8\frac{1}{8}$
0	$6\frac{3}{4}$	1	$6\frac{7}{8}$	0	$10\frac{3}{4}$	2	$7\frac{3}{8}$	1	$2\frac{3}{4}$	3	8	1	$6\frac{3}{4}$	4	$8\frac{1}{2}$
0	$6\frac{7}{8}$	1	$7\frac{1}{4}$	0	$10\frac{7}{8}$	2	$7\frac{3}{4}$	1	$2\frac{7}{8}$	3	$8\frac{3}{8}$	1	$6\frac{7}{8}$	4	$8\frac{7}{8}$
0	7	1	$7\frac{5}{8}$	0	11	2	$8\frac{1}{4}$	1	3	3	$8\frac{3}{4}$	1	7	4	$9\frac{1}{4}$
0	$7\frac{1}{8}$	1	8	0	$11\frac{1}{8}$	2	$8\frac{5}{8}$	1	$3\frac{1}{8}$	3	$9\frac{1}{8}$	1	$7\frac{1}{8}$	4	$9\frac{5}{8}$
0	$7\frac{1}{4}$	1	$8\frac{3}{8}$	0	$11\frac{1}{4}$	2	9	1	$3\frac{1}{4}$	3	$9\frac{1}{2}$	1	$7\frac{1}{4}$	4	$10\frac{1}{8}$
0	$7\frac{3}{8}$	1	$8\frac{3}{4}$	0	$11\frac{3}{8}$	2	$9\frac{3}{8}$	1	$3\frac{3}{8}$	3	$9\frac{7}{8}$	1	$7\frac{3}{8}$	4	$10\frac{1}{2}$
0	$7\frac{1}{2}$	1	$9\frac{1}{8}$	0	$11\frac{1}{2}$	2	$9\frac{3}{4}$	1	$3\frac{1}{2}$	3	$10\frac{3}{8}$	1	$7\frac{1}{2}$	4	$10\frac{7}{8}$
0	$7\frac{5}{8}$	1	$9\frac{1}{2}$	0	$11\frac{5}{8}$	2	$10\frac{1}{8}$	1	$3\frac{5}{8}$	3	$10\frac{3}{4}$	1	$7\frac{5}{8}$	4	$11\frac{1}{4}$
0	$7\frac{3}{4}$	1	10	0	$11\frac{3}{4}$	2	$10\frac{1}{2}$	1	$3\frac{3}{4}$	3	$11\frac{1}{8}$	1	$7\frac{3}{4}$	4	$11\frac{5}{8}$
0	$7\frac{7}{8}$	1	$10\frac{3}{8}$	0	$11\frac{7}{8}$	2	$10\frac{7}{8}$	1	$3\frac{7}{8}$	3	$11\frac{1}{2}$	1	$7\frac{7}{8}$	5	0
0	8	1	$10\frac{3}{4}$	1	0	2	$11\frac{3}{8}$	1	4	3	$11\frac{7}{8}$	1	8	5	$0\frac{3}{8}$
0	$8\frac{1}{8}$	1	$11\frac{1}{8}$	1	$0\frac{1}{8}$	2	$11\frac{3}{4}$	1	$4\frac{1}{8}$	4	$0\frac{1}{4}$	1	$8\frac{1}{8}$	5	$0\frac{7}{8}$
0	$8\frac{1}{4}$	1	$11\frac{1}{2}$	1	$0\frac{1}{4}$	3	$0\frac{1}{8}$	1	$4\frac{1}{4}$	4	$0\frac{5}{8}$	1	$8\frac{1}{4}$	5	$1\frac{1}{4}$
0	$8\frac{3}{8}$	1	$11\frac{7}{8}$	1	$0\frac{3}{8}$	3	$0\frac{1}{2}$	1	$4\frac{3}{8}$	4	1	1	$8\frac{3}{8}$	5	$1\frac{5}{8}$
0	$8\frac{1}{2}$	2	$0\frac{3}{8}$	1	$0\frac{1}{2}$	3	$0\frac{7}{8}$	1	$4\frac{1}{2}$	4	$1\frac{3}{8}$	1	$8\frac{1}{2}$	5	2
0	$8\frac{5}{8}$	2	$0\frac{3}{4}$	1	$0\frac{5}{8}$	3	$1\frac{1}{4}$	1	$4\frac{5}{8}$	4	$1\frac{7}{8}$	1	$8\frac{5}{8}$	5	$2\frac{3}{8}$
0	$8\frac{3}{4}$	2	$1\frac{1}{8}$	1	$0\frac{3}{4}$	3	$1\frac{5}{8}$	1	$4\frac{3}{4}$	4	$2\frac{1}{4}$	1	$8\frac{3}{4}$	5	$2\frac{3}{4}$
0	$8\frac{7}{8}$	2	$1\frac{1}{2}$	1	$0\frac{7}{8}$	3	2	1	$4\frac{7}{8}$	4	$2\frac{5}{8}$	1	$8\frac{7}{8}$	5	$3\frac{1}{8}$
0	9	2	$1\frac{7}{8}$	1	1	3	$2\frac{1}{2}$	1	5	4	3	1	9	5	$3\frac{5}{8}$
0	$9\frac{1}{8}$	2	$2\frac{3}{8}$	1	$1\frac{1}{8}$	3	$2\frac{7}{8}$	1	$5\frac{1}{8}$	4	$3\frac{3}{8}$	1	$9\frac{1}{8}$	5	4
0	$9\frac{1}{4}$	2	$2\frac{3}{4}$	1	$1\frac{1}{4}$	3	$3\frac{1}{4}$	1	$5\frac{1}{4}$	4	$3\frac{3}{4}$	1	$9\frac{1}{4}$	5	$4\frac{3}{8}$
0	$9\frac{3}{8}$	2	$3\frac{1}{8}$	1	$1\frac{3}{8}$	3	$3\frac{5}{8}$	1	$5\frac{3}{8}$	4	$4\frac{1}{8}$	1	$9\frac{3}{8}$	5	$4\frac{3}{4}$
0	$9\frac{1}{2}$	2	$3\frac{1}{2}$	1	$1\frac{1}{2}$	3	4	1	$5\frac{1}{2}$	4	$4\frac{1}{2}$	1	$9\frac{1}{2}$	5	$5\frac{1}{8}$
0	$9\frac{5}{8}$	2	$3\frac{7}{8}$	1	$1\frac{5}{8}$	3	$4\frac{3}{8}$	1	$5\frac{5}{8}$	4	5	1	$9\frac{5}{8}$	5	$5\frac{1}{2}$
0	$9\frac{3}{4}$	2	4	1	$1\frac{3}{4}$	3	$4\frac{7}{8}$	1	$5\frac{3}{4}$	4	$5\frac{3}{8}$	1	$9\frac{3}{4}$	5	$5\frac{7}{8}$
0	$9\frac{7}{8}$	2	$4\frac{5}{8}$	1	$1\frac{7}{8}$	3	$5\frac{1}{4}$	1	$5\frac{7}{8}$	4	$5\frac{3}{4}$	1	$9\frac{7}{8}$	5	$6\frac{3}{8}$

For Angle Iron measuring ⅜ of an Inch thick, diagonally across the root.

FLANGE INSIDE.

OUTSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.		OUTSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.		OUTSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.		OUTSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.	
FT.	IN.	FT.	IN.	FT	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN
1	10	5	6¾	2	2	6	7¼	2	6	7	7⅞	2	10	8	8⅜
1	10⅛	5	7⅛	2	2⅛	6	7⅝	2	6⅛	7	8¼	2	10⅛	8	8⅞
1	10¼	5	7½	2	2¼	6	8⅛	2	6¼	7	8⅝	2	10¼	8	9¼
1	10⅜	5	8	2	2⅜	6	8½	2	6⅜	7	9	2	10⅜	8	9⅝
1	10½	5	8⅜	2	2½	6	8⅞	2	6½	7	9⅜	2	10½	8	10
1	10⅝	5	8¾	2	2⅝	6	9¼	2	6⅝	7	9¾	2	10⅝	8	10⅜
1	10¾	5	9⅛	2	2¾	6	9⅝	2	6¾	7	10¼	2	10¾	8	10¾
1	10⅞	5	9½	2	2⅞	6	10	2	6⅞	7	10⅝	2	10⅞	8	11⅛
1	11	5	9⅞	2	3	6	10½	2	7	7	11	2	11	8	11½
1	11⅛	5	10¼	2	3⅛	6	10⅞	2	7⅛	7	11⅜	2	11⅛	9	0
1	11¼	5	10⅝	2	3¼	6	11¼	2	7¼	7	11¾	2	11¼	9	0⅜
1	11⅜	5	11	2	3⅜	6	11⅝	2	7⅜	8	0⅛	2	11⅜	9	0¾
1	11½	5	11½	2	3½	7	0	2	7½	8	0½	2	11½	9	1⅛
1	11⅝	5	11⅞	2	3⅝	7	0⅜	2	7⅝	8	1	2	11⅝	9	1½
1	11¾	6	0¼	2	3¾	7	0¾	2	7¾	8	1⅜	2	11¾	9	1⅞
1	11⅞	6	0⅝	2	3⅞	7	1⅛	2	7⅞	8	1¾	2	11⅞	9	2⅜
2	0	6	1	2	4	7	1½	2	8	8	2⅛	3	0	9	2¾
2	0⅛	6	1⅜	2	4⅛	7	2	2	8⅛	8	2½	3	0⅛	9	3⅛
2	0¼	6	1¾	2	4¼	7	2⅜	2	8¼	8	2⅞	3	0¼	9	3½
2	0⅜	6	2¼	2	4⅜	7	2¾	2	8⅜	8	3⅜	3	0⅜	9	3⅞
2	0½	6	2⅝	2	4½	7	3⅛	2	8½	8	3¾	3	0½	9	4¼
2	0⅝	6	3	2	4⅝	7	3½	2	8⅝	8	4⅛	3	0⅝	9	4⅝
2	0¾	6	3⅜	2	4¾	7	3⅞	2	8¾	8	4½	3	0¾	9	5
2	0⅞	6	3¾	2	4⅞	7	4⅜	2	8⅞	8	4⅞	3	0⅞	9	5½
2	1	6	4⅛	2	5	7	4¾	2	9	8	5¼	3	1	9	5⅞
2	1⅛	6	4½	2	5⅛	7	5⅛	2	9⅛	8	5⅝	3	1⅛	9	6¼
2	1¼	6	4⅞	2	5¼	7	5½	2	9¼	8	6	3	1¼	9	6⅝
2	1⅜	6	5⅜	2	5⅜	7	5⅞	2	9⅜	8	6½	3	1⅜	9	7
2	1½	6	5¾	2	5½	7	6¼	2	9½	8	6⅞	3	1½	9	7⅜
2	1⅝	6	6⅛	2	5⅝	7	6⅝	2	9⅝	8	7¼	3	1⅝	9	7⅞
2	1¾	6	6½	2	5¾	7	7	2	9¾	8	7⅝	3	1¾	9	8¼
2	1⅞	6	6⅞	2	5⅞	7	7½	2	9⅞	8	8	3	1⅞	9	8⅝

For Angle Iron measuring $\frac{3}{8}$ of an Inch thick, diagonally across the root.

FLANGE INSIDE.

OUTSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.		OUTSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.		OUTSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.		OUTSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.	
FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN
3	2	9	9	3	6	10	9½	3	10	11	10⅛	4	2	12	10¾
3	2⅛	9	9⅜	3	6⅛	10	9⅞	3	10⅛	11	10½	4	2⅛	12	11⅛
3	2¼	9	9¾	3	6¼	10	10⅜	3	10¼	11	10⅞	4	2¼	12	11½
3	2⅜	9	10⅛	3	6⅜	10	10¾	3	10⅜	11	11¼	4	2⅜	12	11⅞
3	2½	9	10½	3	6½	10	11⅛	3	10½	11	11⅝	4	2½	13	0¼
3	2⅝	9	10⅞	3	6⅝	10	11½	3	10⅝	12	0⅛	4	2⅝	13	0⅝
3	2¾	9	11⅜	3	6¾	10	11⅞	3	10¾	12	0½	4	2¾	13	1
3	2⅞	9	11¾	3	6⅞	11	0⅜	3	10⅞	12	0⅞	4	2⅞	13	1½
3	3	10	0⅛	3	7	11	0¾	3	11	12	1¼	4	3	13	1⅞
3	3⅛	10	0½	3	7⅛	11	1⅛	3	11⅛	12	1⅝	4	3⅛	13	2¼
3	3¼	10	0⅞	3	7¼	11	1½	3	11¼	12	2	4	3¼	13	2⅝
3	3⅜	10	1⅜	3	7⅜	11	1⅞	3	11⅜	12	2⅜	4	3⅜	13	3
3	3½	10	1¾	3	7½	11	2¼	3	11½	12	2⅞	4	3½	13	3⅜
3	3⅝	10	2⅛	3	7⅝	11	2⅝	3	11⅝	12	3¼	4	3⅝	13	3¾
3	3¾	10	2½	3	7¾	11	3	3	11¾	12	3⅝	4	3¾	13	4¼
3	3⅞	10	2⅞	3	7⅞	11	3½	3	11⅞	12	4	4	3⅞	13	4⅝
3	4	10	3¼	3	8	11	3⅞	4	0	12	4⅜	4	4	13	5
3	4⅛	10	3⅝	3	8⅛	11	4¼	4	0⅛	12	4¾	4	4⅛	13	5⅜
3	4¼	10	4	3	8¼	11	4⅝	4	0¼	12	5¼	4	4¼	13	5¾
3	4⅜	10	4½	3	8⅜	11	5	4	0⅜	12	5⅝	4	4⅜	13	6⅛
3	4½	10	4⅞	3	8½	11	5⅜	4	0½	12	6	4	4½	13	6½
3	4⅝	10	5¼	3	8⅝	11	5¾	4	0⅝	12	6⅜	4	4⅝	13	7
3	4¾	10	5⅝	3	8¾	11	6¼	4	0¾	12	6¾	4	4¾	13	7⅜
3	4⅞	10	6	3	8⅞	11	6⅝	4	0⅞	12	7⅛	4	4⅞	13	7¾
3	5	10	6⅜	3	9	11	7	4	1	12	7½	4	5	13	8⅛
3	5⅛	10	6⅞	3	9⅛	11	7⅜	4	1⅛	12	7⅞	4	5⅛	13	8½
3	5¼	10	7¼	3	9¼	11	7¾	4	1¼	12	8⅜	4	5¼	13	8⅞
3	5⅜	10	7⅝	3	9⅜	11	8⅛	4	1⅜	12	8¾	4	5⅜	13	9¼
3	5½	10	8	3	9½	11	8½	4	1½	12	9⅛	4	5½	13	9⅝
3	5⅝	10	8⅜	3	9⅝	11	8⅞	4	1⅝	12	9½	4	5⅝	13	10⅛
3	5¾	10	8¾	3	9¾	11	9⅜	4	1¾	12	9⅞	4	5¾	13	10½
3	5⅞	10	9⅛	3	9⅞	11	9¾	4	1⅞	12	10⅜	4	5⅞	13	10⅞

For Angle Iron measuring $\frac{3}{8}$ of an Inch thick, diagonally across the root.

FLANGE INSIDE.

OUTSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.		OUTSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.		OUTSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.		OUTSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.	
FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN	FT.	IN.	FT.	IN.	FT.	IN
4	6	13	11¼	4	10	14	11⅞	5	2	16	0⅜	5	6	17	1
4	6⅛	13	11⅝	4	10⅛	15	0¼	5	2⅛	16	0¾	5	6⅛	17	1⅜
4	6¼	14	0	4	10¼	15	0⅝	5	2¼	16	1⅛	5	6¼	17	1¾
4	6⅜	14	0⅜	4	10⅜	15	1	5	2⅜	16	1⅝	5	6⅜	17	2⅛
4	6½	14	0⅞	4	10½	15	1⅜	5	2½	16	2	5	6½	17	2½
4	6⅝	14	1¼	4	10⅝	15	1⅞	5	2⅝	16	2⅜	5	6⅝	17	2⅞
4	6¾	14	1⅝	4	10¾	15	2¼	5	2¾	16	2¾	5	6¾	17	3⅜
4	6⅞	14	2	4	10⅞	15	2⅝	5	2⅞	16	3⅛	5	6⅞	17	3¾
4	7	14	2⅜	4	11	15	3	5	3	16	3½	5	7	17	4⅛
4	7⅛	14	2¾	4	11⅛	15	3⅜	5	3⅛	16	3⅞	5	7⅛	17	4½
4	7¼	14	3⅛	4	11¼	15	3¾	5	3¼	16	4⅜	5	7¼	17	4⅞
4	7⅜	14	3½	4	11⅜	15	4⅛	5	3⅜	16	4¾	5	7⅜	17	5¼
4	7½	14	4	4	11½	15	4½	5	3½	16	5⅛	5	7½	17	5⅝
4	7⅝	14	4⅜	4	11⅝	15	4⅞	5	3⅝	16	5½	5	7⅝	17	6
4	7¾	14	4¾	4	11¾	15	5⅜	5	3¾	16	5⅞	5	7¾	17	6½
4	7⅞	14	5⅛	4	11⅞	15	5¾	5	3⅞	16	6¼	5	7⅞	17	6⅞
4	8	14	5½	5	0	15	6⅛	5	4	16	6⅝	5	8	17	7¼
4	8⅛	14	5⅞	5	0⅛	15	6½	5	4⅛	16	7	5	8⅛	17	7⅝
4	8¼	14	6⅜	5	0¼	15	6⅞	5	4¼	16	7½	5	8¼	17	8
4	8⅜	14	6¾	5	0⅜	15	7¼	5	4⅜	16	7⅞	5	8⅜	17	8⅜
4	8½	14	7⅛	5	0½	15	7¾	5	4½	16	8¼	5	8½	17	8⅞
4	8⅝	14	7½	5	0⅝	15	8⅛	5	4⅝	16	8⅝	5	8⅝	17	9¼
4	8¾	14	7⅞	5	0¾	15	8½	5	4¾	16	9	5	8¾	17	9⅝
4	8⅞	14	8¼	5	0⅞	15	8⅞	5	4⅞	16	9⅜	5	8⅞	17	10
4	9	14	8¾	5	1	15	9¼	5	5	16	9⅞	5	9	17	10⅜
4	9⅛	14	9⅛	5	1⅛	15	9⅝	5	5⅛	16	10¼	5	9⅛	17	10¾
4	9¼	14	9½	5	1¼	15	10	5	5¼	16	10⅝	5	9¼	17	11⅛
4	9⅜	14	9⅞	5	1⅜	15	10⅜	5	5⅜	16	11	5	9⅜	17	11⅛
4	9½	14	10¼	5	1½	15	10⅞	5	5½	16	11⅜	5	9½	18	0
4	9⅝	14	10⅝	5	1⅝	15	11¼	5	5⅝	16	11¾	5	9⅝	18	0⅜
4	9¾	14	11	5	1¾	15	11⅝	5	5¾	17	0⅛	5	9¾	18	0¾
4	9⅞	14	11½	5	1⅞	16	0	5	5⅞	17	0⅝	5	9⅞	18	1⅛

For Angle Iron measuring ⅜ of an Inch thick, diagonally across the root.

FLANGE INSIDE.

OUTSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.		OUTSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.		OUTSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.		OUTSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.	
FT.	IN	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN
5	10	18	1½	6	2	19	2⅛	6	6	20	2⅝	6	10	21	3¼
5	10⅛	18	1⅞	6	2⅛	19	2½	6	6⅛	20	3	6	10⅛	21	3⅝
5	10¼	18	2⅜	6	2¼	19	2⅞	6	6¼	20	3½	6	10¼	21	4
5	10⅜	18	2¾	6	2⅜	19	3¼	6	6⅜	20	3⅞	6	10⅜	21	4⅜
5	10½	18	3⅛	6	2½	19	3⅝	6	6½	20	4¼	6	10½	21	4¾
5	10⅝	18	3½	6	2⅝	19	4	6	6⅝	20	4⅝	6	10⅝	21	5⅛
5	10¾	18	3⅞	6	2¾	19	4½	6	6¾	20	5	6	10¾	21	5½
5	10⅞	18	4¼	6	2⅞	19	4⅞	6	6⅞	20	5⅜	6	10⅞	21	6
5	11	18	4⅝	6	3	19	5¼	6	7	20	5⅞	6	11	21	6⅜
5	11⅛	18	5	6	3⅛	19	5⅝	6	7⅛	20	6¼	6	11⅛	21	6¾
5	11¼	18	5½	6	3¼	19	6	6	7¼	20	6⅝	6	11¼	21	7⅛
5	11⅜	18	5⅞	6	3⅜	19	6⅜	6	7⅜	20	7	6	11⅜	21	7⅝
5	11½	18	6¼	6	3½	19	6⅞	6	7½	20	7⅜	6	11½	21	8
5	11⅝	18	6⅝	6	3⅝	19	7¼	6	7⅝	20	7¾	6	11⅝	21	8⅜
5	11¾	18	7	6	3¾	19	7⅝	6	7¾	20	8⅛	6	11¾	21	8¾
5	11⅞	18	7⅜	6	3⅞	19	8	6	7⅞	20	8½	6	11⅞	21	9⅛
6	0	18	7⅞	6	4	19	8⅜	6	8	20	9	7	0	21	9½
6	0⅛	18	8¼	6	4⅛	19	8¾	6	8⅛	20	9⅜	7	0⅛	21	9⅞
6	0¼	18	8⅝	6	4¼	19	9⅛	6	8¼	20	9¾	7	0¼	21	10⅜
6	0⅜	18	9	6	4⅜	19	9⅝	6	8⅜	20	10⅛	7	0⅜	21	10¾
6	0½	18	9⅜	6	4½	19	10	6	8½	20	10½	7	0½	21	11⅛
6	0⅝	18	9¾	6	4⅝	19	10⅜	6	8⅝	20	10⅞	7	0⅝	21	11½
6	0¾	18	10⅛	6	4¾	19	10¾	6	8¾	20	11⅜	7	0¾	21	11⅞
6	0⅞	18	10½	6	4⅞	19	11⅛	6	8⅞	20	11¾	7	0⅞	22	0¼
6	1	18	11	6	5	19	11½	6	9	21	0⅛	7	1	22	0⅝
6	1⅛	18	11⅜	6	5⅛	19	11⅞	6	9⅛	21	0½	7	1⅛	22	1
6	1¼	18	11¾	6	5¼	20	0⅜	6	9¼	21	0⅞	7	1¼	22	1½
6	1⅜	19	0⅛	6	5⅜	20	0¾	6	9⅜	21	1¼	7	1⅜	22	1⅞
6	1½	19	0½	6	5½	20	1⅛	6	9½	21	1⅝	7	1½	22	2¼
6	1⅝	19	0⅞	6	5⅝	20	1½	6	9⅝	21	2	7	1⅝	22	2⅝
6	1¾	19	1⅜	6	5¾	20	1⅞	6	9¾	21	2½	7	1¾	22	3
6	1⅞	19	1¾	6	5⅞	20	2¼	6	9⅞	21	2⅞	7	1⅞	22	3⅜

For Angle Iron measuring $\frac{3}{8}$ of an Inch thick, diagonally across the root.

FLANGE INSIDE.

OUTSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.		OUTSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.		OUTSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.		OUTSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.	
FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN
7	2	22	3 7/8	7	6	23	4 3/8	7	10	24	4 7/8	8	2	25	5 1/2
7	2 1/8	22	4 1/4	7	6 1/8	23	4 3/4	7	10 1/8	24	5 3/8	8	2 1/8	25	5 7/8
7	2 1/4	22	4 5/8	7	6 1/4	23	5 1/8	7	10 1/4	24	5 3/4	8	2 1/4	25	6 1/4
7	2 3/8	22	5	7	6 3/8	23	5 1/2	7	10 3/8	24	6 1/8	8	2 3/8	25	6 5/8
7	2 1/2	22	5 3/8	7	6 1/2	23	6	7	10 1/2	24	6 1/2	8	2 1/2	25	7
7	2 5/8	22	5 3/4	7	6 5/8	23	6 3/8	7	10 5/8	24	6 7/8	8	2 5/8	25	7 1/2
7	2 3/4	22	6 1/8	7	6 3/4	23	6 3/4	7	10 3/4	24	7 1/4	8	2 3/4	25	7 7/8
7	2 7/8	22	6 1/2	7	6 7/8	23	7 1/8	7	10 7/8	24	7 5/8	8	2 7/8	25	8 1/4
7	3	22	7	7	7	23	7 1/2	7	11	24	8	8	3	25	8 5/8
7	3 1/8	22	7 3/8	7	7 1/8	23	7 7/8	7	11 1/8	24	8 1/2	8	3 1/8	25	9
7	3 1/4	22	7 3/4	7	7 1/4	23	8 1/4	7	11 1/4	24	8 7/8	8	3 1/4	25	9 1/2
7	3 3/8	22	8 1/8	7	7 3/8	23	8 3/4	7	11 3/8	24	9 1/4	8	3 3/8	25	9 7/8
7	3 1/2	22	8 1/2	7	7 1/2	23	9 1/8	7	11 1/2	24	9 5/8	8	3 1/2	25	10 1/4
7	3 5/8	22	8 7/8	7	7 5/8	23	9 1/2	7	11 5/8	24	10	8	3 5/8	25	10 5/8
7	3 3/4	22	9 1/4	7	7 3/4	23	9 7/8	7	11 3/4	24	10 1/2	8	3 3/4	25	11
7	3 7/8	22	9 3/4	7	7 7/8	23	10 1/4	7	11 7/8	24	10 7/8	8	3 7/8	25	11 3/8
7	4	22	10 1/8	7	8	23	10 5/8	8	0	24	11 1/4	8	4	25	11 3/4
7	4 1/8	22	10 1/2	7	8 1/8	23	11	8	0 1/8	24	11 5/8	8	4 1/8	26	0 1/8
7	4 1/4	22	10 7/8	7	8 1/4	23	11 1/2	8	0 1/4	25	0	8	4 1/4	26	0 5/8
7	4 3/8	22	11 1/4	7	8 3/8	23	11 7/8	8	0 3/8	25	0 3/8	8	4 3/8	26	1
7	4 1/2	22	11 5/8	7	8 1/2	24	0 1/4	8	0 1/2	25	0 3/4	8	4 1/2	26	1 3/8
7	4 5/8	23	0	7	8 5/8	24	0 5/8	8	0 5/8	25	1 1/4	8	4 5/8	26	1 3/4
7	4 3/4	23	0 1/2	7	8 3/4	24	1	8	0 3/4	25	1 5/8	8	4 3/4	26	2 1/8
7	4 7/8	23	0 7/8	7	8 7/8	24	1 3/8	8	0 7/8	25	2	8	4 7/8	26	2 1/2
7	5	23	1 1/4	7	9	24	1 3/4	8	1	25	2 3/8	8	5	26	2 7/8
7	5 1/8	23	1 5/8	7	9 1/8	24	2 1/4	8	1 1/8	25	2 3/4	8	5 1/8	26	3 3/8
7	5 1/4	23	2	7	9 1/4	24	2 5/8	8	1 1/4	25	3 1/8	8	5 1/4	26	3 3/4
7	5 3/8	23	2 3/8	7	9 3/8	24	3	8	1 3/8	25	3 1/2	8	5 3/8	26	4 1/8
7	5 1/2	23	2 3/4	7	9 1/2	24	3 3/8	8	1 1/2	25	3 7/8	8	5 1/2	26	4 1/2
7	5 5/8	23	3 1/4	7	9 5/8	24	3 3/4	8	1 5/8	25	4 3/8	8	5 5/8	26	4 7/8
7	5 3/4	23	3 5/8	7	9 3/4	24	4 1/8	8	1 3/4	25	4 3/4	8	5 3/4	26	5 1/4
7	5 7/8	23	4	7	9 7/8	24	4 1/2	8	1 7/8	25	5 1/8	8	5 7/8	26	5 5/8

TABLE XII.

For ANGLE IRON measuring ½ an Inch thick, diagonally across the root.

FLANGE INSIDE.

OUTSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.		OUTSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.		OUTSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.		OUTSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.	
FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN	FT.	IN.	FT.	IN.	FT.	IN.
0	6	1	3⅝	0	10	2	4¼	1	2	3	4⅞	1	6	4	5⅜
0	6⅛	1	4	0	10⅛	2	4⅝	1	2⅛	3	5¼	1	6⅛	4	5¾
0	6¼	1	4½	0	10¼	2	5	1	2¼	3	5⅝	1	6¼	4	6⅛
0	6⅜	1	4⅞	0	10⅜	2	5½	1	2⅜	3	6	1	6⅜	4	6½
0	6½	1	5¼	0	10½	2	5⅞	1	2½	3	6⅜	1	6½	4	7
0	6⅝	1	5⅝	0	10⅝	2	6¼	1	2⅝	3	6¾	1	6⅝	4	7⅜
0	6¾	1	6	0	10¾	2	6⅝	1	2¾	3	7⅛	1	6¾	4	7¾
0	6⅞	1	6½	0	10⅞	2	7	1	2⅞	3	7⅝	1	6⅞	4	8⅛
0	7	1	6⅞	0	11	2	7⅜	1	3	3	8	1	7	4	8½
0	7⅛	1	7¼	0	11⅛	2	7¾	1	3⅛	3	8⅜	1	7⅛	4	8⅞
0	7¼	1	7⅝	0	11¼	2	8¼	1	3¼	3	8¾	1	7¼	4	9¼
0	7⅜	1	8	0	11⅜	2	8⅝	1	3⅜	3	9⅛	1	7⅜	4	9⅝
0	7½	1	8⅜	0	11½	2	9	1	3½	3	9½	1	7½	4	10⅛
0	7⅝	1	8¾	0	11⅝	2	9⅜	1	3⅝	3	9⅞	1	7⅝	4	10½
0	7¾	1	9⅛	0	11¾	2	9¾	1	3¾	3	10⅜	1	7¾	4	10⅞
0	7⅞	1	9½	0	11⅞	2	10⅛	1	3⅞	3	10¾	1	7⅞	4	11¼
0	8	1	10	1	0	2	10½	1	4	3	11⅛	1	8	4	11⅝
0	8⅛	1	10⅜	1	0⅛	2	10⅞	1	4⅛	3	11½	1	8⅛	5	0
0	8¼	1	10¾	1	0¼	2	11⅜	1	4¼	3	11⅞	1	8¼	5	0⅜
0	8⅜	1	11⅛	1	0⅜	2	11¾	1	4⅜	4	0¼	1	8⅜	5	0⅞
0	8½	1	11½	1	0½	3	0⅛	1	4½	4	0⅝	1	8½	5	1¼
0	8⅝	1	11⅞	1	0⅝	3	0½	1	4⅝	4	1	1	8⅝	5	1⅝
0	8¾	2	0⅜	1	0¾	3	0⅞	1	4¾	4	1⅜	1	8¾	5	2
0	8⅞	2	0¾	1	0⅞	3	1¼	1	4⅞	4	1⅞	1	8⅞	5	2⅜
0	9	2	1⅛	1	1	3	1⅝	1	5	4	2¼	1	9	5	2¾
0	9⅛	2	1½	1	1⅛	3	2	1	5⅛	4	2⅝	1	9⅛	5	3⅛
0	9¼	2	1⅞	1	1¼	3	2½	1	5¼	4	3	1	9¼	5	3⅝
0	9⅜	2	2⅜	1	1⅜	3	2⅞	1	5⅜	4	3⅜	1	9⅜	5	4
0	9½	2	2¾	1	1½	3	3¼	1	5½	4	3¾	1	9½	5	4⅜
0	9⅝	2	3⅛	1	1⅝	3	3⅝	1	5⅝	4	4⅛	1	9⅝	5	4¾
0	9¾	2	3½	1	1¾	3	4	1	5¾	4	4½	1	9¾	5	5⅛
0	9⅞	2	3⅞	1	1⅞	3	4⅜	1	5⅞	4	5	1	9⅞	5	5½

For Angle Iron measuring ½ an Inch thick, diagonally across the root.

FLANGE INSIDE.

OUTSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.		OUTSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.		OUTSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.		OUTSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.	
FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.
1	10	5	5 7/8	2	2	6	6½	2	6	7	7	2	10	8	7⅝
1	10⅛	5	6⅜	2	2⅛	6	6⅞	2	6⅛	7	7½	2	10⅛	8	8
1	10¼	5	6¾	2	2¼	6	7¼	2	6¼	7	7⅞	2	10¼	8	8⅜
1	10⅜	5	7⅛	2	2⅜	6	7⅝	2	6⅜	7	8¼	2	10⅜	8	8⅞
1	10½	5	7½	2	2½	6	8⅛	2	6½	7	8⅝	2	10½	8	9¼
1	10⅝	5	8	2	2⅝	6	8½	2	6⅝	7	9	2	10⅝	8	9⅝
1	10¾	5	8⅜	2	2¾	6	8⅞	2	6¾	7	9⅜	2	10¾	8	10
1	10⅞	5	8¾	2	2⅞	6	9¼	2	6⅞	7	9¾	2	10⅞	8	10⅜
1	11	5	9⅛	2	3	6	9⅝	2	7	7	10¼	2	11	8	10¾
1	11⅛	5	9½	2	3⅛	6	10	2	7⅛	7	10⅝	2	11⅛	8	11⅛
1	11¼	5	9⅞	2	3¼	6	10½	2	7¼	7	11	2	11¼	8	11½
1	11⅜	5	10¼	2	3⅜	6	10⅞	2	7⅜	7	11⅜	2	11⅜	9	0
1	11½	5	10⅝	2	3½	6	11¼	2	7½	7	11¾	2	11½	9	0⅜
1	11⅝	5	11	2	3⅝	6	11⅝	2	7⅝	8	0⅛	2	11⅝	9	0¾
1	11¾	5	11½	2	3¾	7	0	2	7¾	8	0½	2	11¾	9	1⅛
1	11⅞	5	11⅞	2	3⅞	7	0⅜	2	7⅞	8	1	2	11⅞	9	1½
2	0	6	0¼	2	4	7	0¾	2	8	8	1⅜	3	0	9	1⅞
2	0⅛	6	0⅝	2	4⅛	7	1⅛	2	8⅛	8	1¾	3	0⅛	9	2⅜
2	0¼	6	1	2	4¼	7	1½	2	8¼	8	2⅛	3	0¼	9	2¾
2	0⅜	6	1⅜	2	4⅜	7	2	2	8⅜	8	2½	3	0⅜	9	3⅛
2	0½	6	1¾	2	4½	7	2⅜	2	8½	8	2⅞	3	0½	9	3½
2	0⅝	6	2¼	2	4⅝	7	2¾	2	8⅝	8	3⅜	3	0⅝	9	3⅞
2	0¾	6	2⅝	2	4¾	7	3⅛	2	8¾	8	3¾	3	0¾	9	4¼
2	0⅞	6	3	2	4⅞	7	3½	2	8⅞	8	4⅛	3	0⅞	9	4⅝
2	1	6	3⅜	2	5	7	3⅞	2	9	8	4½	3	1	9	5
2	1⅛	6	3¾	2	5⅛	7	4⅜	2	9⅛	8	4⅞	3	1⅛	9	5½
2	1¼	6	4⅛	2	5¼	7	4¾	2	9¼	8	5¼	3	1¼	9	5⅞
2	1⅜	6	4½	2	5⅜	7	5⅛	2	9⅜	8	5⅝	3	1⅜	9	6¼
2	1½	6	4⅞	2	5½	7	5½	2	9½	8	6	3	1½	9	6⅝
2	1⅝	6	5⅜	2	5⅝	7	5⅞	2	9⅝	8	6½	3	1⅝	9	7
2	1¾	6	5¾	2	5¾	7	6¼	2	9¾	8	6⅞	3	1¾	9	7⅜
2	1⅞	6	6⅛	2	5⅞	7	6⅝	2	9⅞	8	7¼	3	1⅞	9	7⅞

For Angle Iron measuring ½ an Inch thick, diagonally across the root.

FLANGE INSIDE.

OUTSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.		OUTSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.		OUTSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.		OUTSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.	
FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.
3	2	9	8¼	3	6	10	8¾	3	10	11	9⅜	4	2	12	9⅞
3	2⅛	9	8⅝	3	6⅛	10	9⅛	3	10⅛	11	9¾	4	2⅛	12	10⅜
3	2¼	9	9	3	6¼	10	9½	3	10¼	11	10⅛	4	2¼	12	10¾
3	2⅜	9	9⅜	3	6⅜	10	9⅞	3	10⅜	11	10½	4	2⅜	12	11⅛
3	2½	9	9¾	3	6½	10	10⅜	3	10½	11	10⅞	4	2½	12	11½
3	2⅝	9	10⅛	3	6⅝	10	10¾	3	10⅝	11	11¼	4	2⅝	12	11⅞
3	2¾	9	10½	3	6¾	10	11⅛	3	10¾	11	11⅝	4	2¾	13	0¼
3	2⅞	9	10⅞	3	6⅞	10	11½	3	10⅞	12	0⅛	4	2⅞	13	0⅝
3	3	9	11⅜	3	7	10	11⅞	3	11	12	0½	4	3	13	1
3	3⅛	9	11¾	3	7⅛	11	0⅜	3	11⅛	12	0⅞	4	3⅛	13	1½
3	3¼	10	0⅛	3	7¼	11	0¾	3	11¼	12	1¼	4	3¼	13	1⅞
3	3⅜	10	0½	3	7⅜	11	1⅛	3	11⅜	12	1⅝	4	3⅜	13	2¼
3	3½	10	0⅞	3	7½	11	1½	3	11½	12	2	4	3½	13	2⅝
3	3⅝	10	1⅜	3	7⅝	11	1⅞	3	11⅝	12	2⅜	4	3⅝	13	3
3	3¾	10	1¾	3	7¾	11	2¼	3	11¾	12	2⅞	4	3¾	13	3⅜
3	3⅞	10	2⅛	3	7⅞	11	2⅝	3	11⅞	12	3¼	4	3⅞	13	3¾
3	4	10	2½	3	8	11	3	4	0	12	3⅝	4	4	13	4¼
3	4⅛	10	2⅞	3	8⅛	11	3½	4	0⅛	12	4	4	4⅛	13	4⅝
3	4¼	10	3¼	3	8¼	11	3⅞	4	0¼	12	4⅜	4	4¼	13	5
3	4⅜	10	3⅜	3	8⅜	11	4¼	4	0⅜	12	4¾	4	4⅜	13	5⅜
3	4½	10	4	3	8½	11	4⅝	4	0½	12	5¼	4	4½	13	5¾
3	4⅝	10	4½	3	8⅝	11	5	4	0⅝	12	5⅝	4	4⅝	13	6⅛
3	4¾	10	4⅞	3	8¾	11	5⅜	4	0¾	12	6	4	4¾	13	6½
3	4⅞	10	5¼	3	8⅞	11	5¾	4	0⅞	12	6⅜	4	4⅞	13	7
3	5	10	5⅝	3	9	11	6¼	4	1	12	6¾	4	5	13	7⅜
3	5⅛	10	6	3	9⅛	11	6⅝	4	1⅛	12	7⅛	4	5⅛	13	7¾
3	5¼	10	6⅜	3	9¼	11	7	4	1¼	12	7½	4	5¼	13	8⅛
3	5⅜	10	6⅞	3	9⅜	11	7⅜	4	1⅜	12	7⅞	4	5⅜	13	8½
3	5½	10	7¼	3	9½	11	7¾	4	1½	12	8⅜	4	5½	13	8⅞
3	5⅝	10	7⅝	3	9⅝	11	8⅛	4	1⅝	12	8¾	4	5⅝	13	9¼
3	5¾	10	8	3	9¾	11	8½	4	1¾	12	9⅛	4	5¾	13	9⅝
3	5⅞	10	8⅜	3	9⅞	11	8⅞	4	1⅞	12	9½	4	5⅞	13	10⅛

For Angle Iron measuring ½ an Inch thick, diagonally across the root.

FLANGE INSIDE.

OUTSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.		OUTSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.		OUTSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.		OUTSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.	
FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN
4	6	13	10½	4	10	14	11	5	2	15	11⅝	5	6	17	0⅛
4	6⅛	13	10⅞	4	10⅛	14	11½	5	2⅛	16	0	5	6⅛	17	0⅝
4	6¼	13	11¼	4	10¼	14	11⅞	5	2¼	16	0⅜	5	6¼	17	1
4	6⅜	13	11⅝	4	10⅜	15	0¼	5	2⅜	16	0¾	5	6⅜	17	1⅜
4	6½	14	0	4	10½	15	0⅝	5	2½	16	1⅛	5	6½	17	1¾
4	6⅝	14	0⅜	4	10⅝	15	1	5	2⅝	16	1⅝	5	6⅝	17	2⅛
4	6¾	14	0⅞	4	10¾	15	1⅜	5	2¾	16	2	5	6¾	17	2½
4	6⅞	14	1¼	4	10⅞	15	1⅞	5	2⅞	16	2⅜	5	6⅞	17	2⅞
4	7	14	1⅝	4	11	15	2¼	5	3	16	2¾	5	7	17	3⅜
4	7⅛	14	2	4	11⅛	15	2⅝	5	3⅛	16	3⅛	5	7⅛	17	3¾
4	7¼	14	2⅜	4	11¼	15	3	5	3¼	16	3½	5	7¼	17	4⅛
4	7⅜	14	2¾	4	11⅜	15	3⅜	5	3⅜	16	3⅞	5	7⅜	17	4½
4	7½	14	3⅛	4	11½	15	3¾	5	3½	16	4⅜	5	7½	17	4⅞
4	7⅝	14	3½	4	11⅝	15	4⅛	5	3⅝	16	4¾	5	7⅝	17	5¼
4	7¾	14	4	4	11¾	15	4½	5	3¾	16	5⅛	5	7¾	17	5⅝
4	7⅞	14	4⅜	4	11⅞	15	4⅞	5	3⅞	16	5½	5	7⅞	17	6
4	8	14	4¾	5	0	15	5⅜	5	4	16	5⅞	5	8	17	6½
4	8⅛	14	5⅛	5	0⅛	15	5¾	5	4⅛	16	6¼	5	8⅛	17	6⅞
4	8¼	14	5½	5	0¼	15	6⅛	5	4¼	16	6⅝	5	8¼	17	7¼
4	8⅜	14	5⅞	5	0⅜	15	6½	5	4⅜	16	7	5	8⅜	17	7⅝
4	8½	14	6⅜	5	0½	15	6⅞	5	4½	16	7½	5	8½	17	8
4	8⅝	14	6¾	5	0⅝	15	7¼	5	4⅝	16	7⅞	5	8⅝	17	8⅜
4	8¾	14	7⅛	5	0¾	15	7¾	5	4¾	16	8¼	5	8¾	17	8⅞
4	8⅞	14	7½	5	0⅞	15	8⅛	5	4⅞	16	8⅝	5	8⅞	17	9¼
4	9	14	7⅞	5	1	15	8½	5	5	16	9	5	9	17	9⅝
4	9⅛	14	8¼	5	1⅛	15	8⅞	5	5⅛	16	9⅜	5	9⅛	17	10
4	9¼	14	8¾	5	1¼	15	9¼	5	5¼	16	9⅞	5	9¼	17	10⅜
4	9⅜	14	9⅛	5	1⅜	15	9⅝	5	5⅜	16	10¼	5	9⅜	17	10¾
4	9½	14	9½	5	1½	15	10	5	5½	16	10⅝	5	9½	17	11⅛
4	9⅝	14	9⅞	5	1⅝	15	10⅜	5	5⅝	16	11	5	9⅝	17	11½
4	9¾	14	10¼	5	1¾	15	10⅞	5	5¾	16	11⅜	5	9¾	18	0
4	9⅞	14	10⅝	5	1⅞	15	11¼	5	5⅞	16	11¾	5	9⅞	18	0⅜

For Angle Iron measuring ½ an Inch thick, diagonally across the root.

FLANGE INSIDE.

OUTSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.		OUTSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.		OUTSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.		OUTSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.	
FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN
5	10	18	0¾	6	2	19	1⅜	6	6	20	1⅞	6	10	21	2½
5	10⅛	18	1⅛	6	2⅛	19	1¾	6	6⅛	20	2¼	6	10⅛	21	2⅞
5	10¼	18	1½	6	2¼	19	2⅛	6	6¼	20	2⅝	6	10¼	21	3¼
5	10⅜	18	1⅞	6	2⅜	19	2½	6	6⅜	20	3	6	10⅜	21	3⅝
5	10½	18	2⅜	6	2½	19	2⅞	6	6½	20	3½	6	10½	21	4
5	10⅝	18	2¾	6	2⅝	19	3¼	6	6⅝	20	3⅞	6	10⅝	21	4⅜
5	10¾	18	3⅛	6	2¾	19	3⅝	6	6¾	20	4¼	6	10¾	21	4¾
5	10⅞	18	3½	6	2⅞	19	4	6	6⅞	20	4⅝	6	10⅞	21	5⅛
5	11	18	3⅞	6	3	19	4½	6	7	20	5	6	11	21	5½
5	11⅛	18	4¼	6	3⅛	19	4⅞	6	7⅛	20	5⅜	6	11⅛	21	6
5	11¼	18	4⅝	6	3¼	19	5¼	6	7¼	20	5⅞	6	11¼	21	6⅜
5	11⅜	18	5	6	3⅜	19	5⅝	6	7⅜	20	6¼	6	11⅜	21	6¾
5	11½	18	5½	6	3½	19	6	6	7½	20	6⅝	6	11½	21	7⅛
5	11⅝	18	5⅞	6	3⅝	19	6⅜	6	7⅝	20	7	6	11⅝	21	7⅝
5	11¾	18	6¼	6	3¾	19	6⅞	6	7¾	20	7⅜	6	11¾	21	8
5	11⅞	18	6⅝	6	3⅞	19	7¼	6	7⅞	20	7¾	6	11⅞	21	8⅜
6	0	18	7	6	4	19	7⅝	6	8	20	8⅛	7	0	21	8¾
6	0⅛	18	7⅜	6	4⅛	19	8	6	8⅛	20	8½	7	0⅛	21	9⅛
6	0¼	18	7⅞	6	4¼	19	8⅜	6	8¼	20	9	7	0¼	21	9½
6	0⅜	18	8¼	6	4⅜	19	8¾	6	8⅜	20	9⅜	7	0⅜	21	9⅞
6	0½	18	8⅝	6	4½	19	9⅛	6	8½	20	9¾	7	0½	21	10⅜
6	0⅝	18	9	6	4⅝	19	9⅝	6	8⅝	20	10⅛	7	0⅝	21	10¾
6	0¾	18	9⅜	6	4¾	19	10	6	8¾	20	10½	7	0¾	21	11⅛
6	0⅞	18	9¾	6	4⅞	19	10⅜	6	8⅞	20	10⅞	7	0⅞	21	11½
6	1	18	10⅛	6	5	19	10¾	6	9	20	11⅜	7	1	21	11⅞
6	1⅛	18	10½	6	5⅛	19	11⅛	6	9⅛	20	11¾	7	1⅛	22	0¼
6	1¼	18	11	6	5¼	19	11½	6	9¼	21	0⅛	7	1¼	22	0⅝
6	1⅜	18	11⅜	6	5⅜	19	11⅞	6	9⅜	21	0½	7	1⅜	22	1
6	1½	18	11¾	6	5½	20	0⅜	6	9½	21	0⅞	7	1½	22	1½
6	1⅝	19	0⅛	6	5⅝	20	0¾	6	9⅝	21	1¼	7	1⅝	22	1⅞
6	1¾	19	0½	6	5¾	20	1⅛	6	9¾	21	1⅝	7	1¾	22	2¼
6	1⅞	19	0⅞	6	5⅞	20	1½	6	9⅞	21	2	7	1⅞	22	2⅝

For Angle Iron measuring ½ an Inch thick, diagonally across the root.

FLANGE INSIDE.

OUTSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.		OUTSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.		OUTSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.		OUTSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.	
FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.
7	2	22	3	7	6	23	3⅝	7	10	24	4⅛	8	2	25	4¾
7	2⅛	22	3⅜	7	6⅛	23	4	7	10⅛	24	4⅛	8	2⅛	25	5⅛
7	2¼	22	3⅞	7	6¼	23	4⅜	7	10¼	24	4⅞	8	2¼	25	5½
7	2⅜	22	4¼	7	6⅜	23	4¾	7	10⅜	24	5⅜	8	2⅜	25	5⅞
7	2½	22	4⅝	7	6½	23	5⅛	7	10½	24	5¾	8	2½	25	6¼
7	2⅝	22	5	7	6⅝	23	5½	7	10⅝	24	6⅛	8	2⅝	25	6⅝
7	2¾	22	5⅜	7	6¾	23	6	7	10¾	24	6½	8	2¾	25	7
7	2⅞	22	5¾	7	6⅞	23	6⅜	7	10⅞	24	6⅞	8	2⅞	25	7½
7	3	22	6⅛	7	7	23	6¾	7	11	24	7¼	8	3	25	7⅞
7	3⅛	22	6½	7	7⅛	23	7⅛	7	11⅛	24	7⅝	8	3⅛	25	8¼
7	3¼	22	7	7	7¼	23	7½	7	11¼	24	8	8	3¼	25	8⅝
7	3⅜	22	7⅜	7	7⅜	23	7⅞	7	11⅜	24	8½	8	3⅜	25	9
7	3½	22	7¾	7	7½	23	8¼	7	11½	24	8⅞	8	3½	25	9½
7	3⅝	22	8⅛	7	7⅝	23	8¾	7	11⅝	24	9¼	8	3⅝	25	9⅞
7	3¾	22	8½	7	7¾	23	9⅛	7	11¾	24	9⅝	8	3¾	25	10¼
7	3⅞	22	8⅞	7	7⅞	23	9½	7	11⅞	24	10	8	3⅞	25	10⅝
7	4	22	9¼	7	8	23	9⅞	8	0	24	10½	8	4	25	11
7	4⅛	22	9¾	7	8⅛	23	10¼	8	0⅛	24	10⅞	8	4⅛	25	11⅜
7	4¼	22	10⅛	7	8¼	23	10⅝	8	0¼	24	11¼	8	4¼	25	11¾
7	4⅜	22	10½	7	8⅜	23	11	8	0⅜	24	11⅝	8	4⅜	26	0⅛
7	4½	22	10⅞	7	8½	23	11½	8	0½	25	0	8	4½	26	0⅝
7	4⅝	22	11¼	7	8⅝	23	11⅞	8	0⅝	25	0⅜	8	4⅝	26	1
7	4¾	22	11⅝	7	8¾	24	0¼	8	0¾	25	0¾	8	4¾	26	1⅜
7	4⅞	23	0	7	8⅞	24	0⅝	8	0⅞	25	1¼	8	4⅞	26	1¾
7	5	23	0½	7	9	24	1	8	1	25	1⅝	8	5	26	2⅛
7	5⅛	23	0⅞	7	9⅛	24	1⅜	8	1⅛	25	2	8	5⅛	26	2½
7	5¼	23	1¼	7	9¼	24	1¾	8	1¼	25	2⅜	8	5¼	26	2⅞
7	5⅜	23	1⅝	7	9⅜	24	2¼	8	1⅜	25	2¾	8	5⅜	26	3⅜
7	5½	23	2	7	9½	24	2⅝	8	1½	25	3⅛	8	5½	26	3¾
7	5⅝	23	2⅜	7	9⅝	24	3	8	1⅝	25	3½	8	5⅝	26	4⅛
7	5¾	23	2¾	7	9¾	24	3⅜	8	1¾	25	3⅞	8	5¾	26	4½
7	5⅞	23	3¼	7	9⅞	24	3¾	8	1⅞	25	4⅜	8	5⅞	26	4⅞

TABLE XIII.

For Angle Iron measuring $\frac{5}{8}$ of an Inch thick, diagonally across the root.

FLANGE INSIDE.

OUTSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.		OUTSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.		OUTSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.		OUTSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.	
FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.
0	6	1	$2\frac{7}{8}$	0	10	2	$3\frac{1}{2}$	1	2	3	4	1	6	4	$4\frac{1}{2}$
0	$6\frac{1}{8}$	1	$3\frac{1}{4}$	0	$10\frac{1}{8}$	2	$3\frac{7}{8}$	1	$2\frac{1}{8}$	3	$4\frac{3}{8}$	1	$6\frac{1}{8}$	4	5
0	$6\frac{1}{4}$	1	$3\frac{5}{8}$	0	$10\frac{1}{4}$	2	$4\frac{1}{4}$	1	$2\frac{1}{4}$	3	$4\frac{7}{8}$	1	$6\frac{1}{4}$	4	$5\frac{3}{8}$
0	$6\frac{3}{8}$	1	4	0	$10\frac{3}{8}$	2	$4\frac{5}{8}$	1	$2\frac{3}{8}$	3	$5\frac{1}{4}$	1	$6\frac{3}{8}$	4	$5\frac{3}{4}$
0	$6\frac{1}{2}$	1	$4\frac{1}{2}$	0	$10\frac{1}{2}$	2	5	1	$2\frac{1}{2}$	3	$5\frac{5}{8}$	1	$6\frac{1}{2}$	4	$6\frac{1}{8}$
0	$6\frac{5}{8}$	1	$4\frac{7}{8}$	0	$10\frac{5}{8}$	2	$5\frac{1}{2}$	1	$2\frac{5}{8}$	3	6	1	$6\frac{5}{8}$	4	$6\frac{1}{2}$
0	$6\frac{3}{4}$	1	$5\frac{1}{4}$	0	$10\frac{3}{4}$	2	$5\frac{7}{8}$	1	$2\frac{3}{4}$	3	$6\frac{3}{8}$	1	$6\frac{3}{4}$	4	7
0	$6\frac{7}{8}$	1	$5\frac{5}{8}$	0	$10\frac{7}{8}$	2	$6\frac{1}{4}$	1	$2\frac{7}{8}$	3	$6\frac{3}{4}$	1	$6\frac{7}{8}$	4	$7\frac{3}{8}$
0	7	1	6	0	11	2	$6\frac{5}{8}$	1	3	3	$7\frac{1}{8}$	1	7	4	$7\frac{3}{4}$
0	$7\frac{1}{8}$	1	$6\frac{1}{2}$	0	$11\frac{1}{8}$	2	7	1	$3\frac{1}{8}$	3	$7\frac{5}{8}$	1	$7\frac{1}{8}$	4	$8\frac{1}{8}$
0	$7\frac{1}{4}$	1	$6\frac{7}{8}$	0	$11\frac{1}{4}$	2	$7\frac{3}{8}$	1	$3\frac{1}{4}$	3	8	1	$7\frac{1}{4}$	4	$8\frac{1}{2}$
0	$7\frac{3}{8}$	1	$7\frac{1}{4}$	0	$11\frac{3}{8}$	2	$7\frac{3}{4}$	1	$3\frac{3}{8}$	3	$8\frac{3}{8}$	1	$7\frac{3}{8}$	4	$8\frac{7}{8}$
0	$7\frac{1}{2}$	1	$7\frac{5}{8}$	0	$11\frac{1}{2}$	2	$8\frac{1}{4}$	1	$3\frac{1}{2}$	3	$8\frac{3}{4}$	1	$7\frac{1}{2}$	4	$9\frac{1}{4}$
0	$7\frac{5}{8}$	1	8	0	$11\frac{5}{8}$	2	$8\frac{5}{8}$	1	$3\frac{5}{8}$	3	$9\frac{1}{8}$	1	$7\frac{5}{8}$	4	$9\frac{5}{8}$
0	$7\frac{3}{4}$	1	$8\frac{3}{8}$	0	$11\frac{3}{4}$	2	9	1	$3\frac{3}{4}$	3	$9\frac{1}{2}$	1	$7\frac{3}{4}$	4	10
0	$7\frac{7}{8}$	1	$8\frac{3}{4}$	0	$11\frac{7}{8}$	2	$9\frac{3}{8}$	1	$3\frac{7}{8}$	3	$9\frac{7}{8}$	1	$7\frac{7}{8}$	4	$10\frac{1}{2}$
0	8	1	$9\frac{1}{8}$	1	0	2	$9\frac{3}{4}$	1	4	3	$10\frac{3}{8}$	1	8	4	$10\frac{7}{8}$
0	$8\frac{1}{8}$	1	$9\frac{1}{2}$	1	$0\frac{1}{8}$	2	$10\frac{1}{8}$	1	$4\frac{1}{8}$	3	$10\frac{3}{4}$	1	$8\frac{1}{8}$	4	$11\frac{1}{4}$
0	$8\frac{1}{4}$	1	10	1	$0\frac{1}{4}$	2	$10\frac{1}{2}$	1	$4\frac{1}{4}$	3	$11\frac{1}{8}$	1	$8\frac{1}{4}$	4	$11\frac{5}{8}$
0	$8\frac{3}{8}$	1	$10\frac{3}{8}$	1	$0\frac{3}{8}$	2	$10\frac{7}{8}$	1	$4\frac{3}{8}$	3	$11\frac{1}{2}$	1	$8\frac{3}{8}$	5	0
0	$8\frac{1}{2}$	1	$10\frac{3}{4}$	1	$0\frac{1}{2}$	2	$11\frac{3}{8}$	1	$4\frac{1}{2}$	3	$11\frac{7}{8}$	1	$8\frac{1}{2}$	5	$0\frac{3}{8}$
0	$8\frac{5}{8}$	1	$11\frac{1}{8}$	1	$0\frac{5}{8}$	2	$11\frac{3}{4}$	1	$4\frac{5}{8}$	4	$0\frac{1}{4}$	1	$8\frac{5}{8}$	5	$0\frac{7}{8}$
0	$8\frac{3}{4}$	1	$11\frac{1}{2}$	1	$0\frac{3}{4}$	3	$0\frac{1}{8}$	1	$4\frac{3}{4}$	4	$0\frac{5}{8}$	1	$8\frac{3}{4}$	5	$1\frac{1}{4}$
0	$8\frac{7}{8}$	1	$11\frac{7}{8}$	1	$0\frac{7}{8}$	3	$0\frac{1}{2}$	1	$4\frac{7}{8}$	4	1	1	$8\frac{7}{8}$	5	$1\frac{5}{8}$
0	9	2	$0\frac{3}{8}$	1	1	3	$0\frac{7}{8}$	1	5	4	$1\frac{3}{8}$	1	9	5	2
0	$9\frac{1}{8}$	2	$0\frac{3}{4}$	1	$1\frac{1}{8}$	3	$1\frac{1}{4}$	1	$5\frac{1}{8}$	4	$1\frac{7}{8}$	1	$9\frac{1}{8}$	5	$2\frac{3}{8}$
0	$9\frac{1}{4}$	2	$1\frac{1}{8}$	1	$1\frac{1}{4}$	3	$1\frac{5}{8}$	1	$5\frac{1}{4}$	4	$2\frac{1}{4}$	1	$9\frac{1}{4}$	5	$2\frac{3}{4}$
0	$9\frac{3}{8}$	2	$1\frac{1}{2}$	1	$1\frac{3}{8}$	3	2	1	$5\frac{3}{8}$	4	$2\frac{5}{8}$	1	$9\frac{3}{8}$	5	$3\frac{1}{8}$
0	$9\frac{1}{2}$	2	$1\frac{7}{8}$	1	$1\frac{1}{2}$	3	$2\frac{1}{2}$	1	$5\frac{1}{2}$	4	3	1	$9\frac{1}{2}$	5	$3\frac{5}{8}$
0	$9\frac{5}{8}$	2	$2\frac{3}{8}$	1	$1\frac{5}{8}$	3	$2\frac{7}{8}$	1	$5\frac{5}{8}$	4	$3\frac{3}{8}$	1	$9\frac{5}{8}$	5	4
0	$9\frac{3}{4}$	2	$2\frac{3}{4}$	1	$1\frac{3}{4}$	3	$3\frac{1}{4}$	1	$5\frac{3}{4}$	4	$3\frac{3}{4}$	1	$9\frac{3}{4}$	5	$4\frac{3}{8}$
0	$9\frac{7}{8}$	2	$3\frac{1}{8}$	1	$1\frac{7}{8}$	3	$3\frac{3}{8}$	1	$5\frac{7}{8}$	4	$4\frac{1}{8}$	1	$9\frac{7}{8}$	5	$4\frac{3}{4}$

For Angle Iron measuring $\frac{5}{8}$ of an Inch thick, diagonally across the root.

FLANGE INSIDE.

OUTSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.		OUTSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.		OUTSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.		OUTSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.	
FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.
1	10	5	$5\frac{1}{8}$	2	2	6	$5\frac{3}{4}$	2	6	7	$6\frac{1}{4}$	2	10	8	$6\frac{7}{8}$
1	$10\frac{1}{8}$	5	$5\frac{1}{2}$	2	$2\frac{1}{8}$	6	$6\frac{1}{8}$	2	$6\frac{1}{8}$	7	$6\frac{5}{8}$	2	$10\frac{1}{8}$	8	$7\frac{1}{4}$
1	$10\frac{1}{4}$	5	$5\frac{7}{8}$	2	$2\frac{1}{4}$	6	$6\frac{1}{2}$	2	$6\frac{1}{4}$	7	7	2	$10\frac{1}{4}$	8	$7\frac{5}{8}$
1	$10\frac{3}{8}$	5	$6\frac{3}{8}$	2	$2\frac{3}{8}$	6	$6\frac{7}{8}$	2	$6\frac{3}{8}$	7	$7\frac{1}{2}$	2	$10\frac{3}{8}$	8	8
1	$10\frac{1}{2}$	5	$6\frac{3}{4}$	2	$2\frac{1}{2}$	6	$7\frac{1}{4}$	2	$6\frac{1}{2}$	7	$7\frac{7}{8}$	2	$10\frac{1}{2}$	8	$8\frac{3}{8}$
1	$10\frac{5}{8}$	5	$7\frac{1}{8}$	2	$2\frac{5}{8}$	6	$7\frac{5}{8}$	2	$6\frac{5}{8}$	7	$8\frac{1}{4}$	2	$10\frac{5}{8}$	8	$8\frac{7}{8}$
1	$10\frac{3}{4}$	5	$7\frac{1}{2}$	2	$2\frac{3}{4}$	6	$8\frac{1}{8}$	2	$6\frac{3}{4}$	7	$8\frac{5}{8}$	2	$10\frac{3}{4}$	8	$9\frac{1}{4}$
1	$10\frac{7}{8}$	5	8	2	$2\frac{7}{8}$	6	$8\frac{1}{2}$	2	$6\frac{7}{8}$	7	9	2	$10\frac{7}{8}$	8	$9\frac{5}{8}$
1	11	5	$8\frac{3}{8}$	2	3	6	$8\frac{7}{8}$	2	7	7	$9\frac{3}{8}$	2	11	8	10
1	$11\frac{1}{8}$	5	$8\frac{3}{4}$	2	$3\frac{1}{8}$	6	$9\frac{1}{4}$	2	$7\frac{1}{8}$	7	$9\frac{3}{4}$	2	$11\frac{1}{8}$	8	$10\frac{3}{8}$
1	$11\frac{1}{4}$	5	$9\frac{1}{8}$	2	$3\frac{1}{4}$	6	$9\frac{5}{8}$	2	$7\frac{1}{4}$	7	10	2	$11\frac{1}{4}$	8	$10\frac{3}{4}$
1	$11\frac{3}{8}$	5	$9\frac{1}{2}$	2	$3\frac{3}{8}$	6	10	2	$7\frac{3}{8}$	7	$10\frac{5}{8}$	2	$11\frac{3}{8}$	8	$11\frac{1}{8}$
1	$11\frac{1}{2}$	5	$9\frac{7}{8}$	2	$3\frac{1}{2}$	6	$10\frac{1}{2}$	2	$7\frac{1}{2}$	7	11	2	$11\frac{1}{2}$	8	$11\frac{1}{2}$
1	$11\frac{5}{8}$	5	$10\frac{1}{4}$	2	$3\frac{5}{8}$	6	$10\frac{7}{8}$	2	$7\frac{5}{8}$	7	$11\frac{3}{8}$	2	$11\frac{5}{8}$	9	0
1	$11\frac{3}{4}$	5	$10\frac{5}{8}$	2	$3\frac{3}{4}$	6	$11\frac{1}{4}$	2	$7\frac{3}{4}$	7	$11\frac{3}{4}$	2	$11\frac{3}{4}$	9	$0\frac{3}{8}$
1	$11\frac{7}{8}$	5	11	2	$3\frac{7}{8}$	6	$11\frac{5}{8}$	2	$7\frac{7}{8}$	8	$0\frac{1}{8}$	2	$11\frac{7}{8}$	9	$0\frac{3}{4}$
2	0	5	$11\frac{1}{2}$	2	4	7	0	2	8	8	$0\frac{1}{2}$	3	0	9	$1\frac{1}{8}$
2	$0\frac{1}{8}$	5	$11\frac{7}{8}$	2	$4\frac{1}{8}$	7	$0\frac{3}{8}$	2	$8\frac{1}{8}$	8	1	3	$0\frac{1}{8}$	9	$1\frac{1}{2}$
2	$0\frac{1}{4}$	6	$0\frac{1}{4}$	2	$4\frac{1}{4}$	7	$0\frac{3}{4}$	2	$8\frac{1}{4}$	8	$1\frac{3}{8}$	3	$0\frac{1}{4}$	9	$1\frac{7}{8}$
2	$0\frac{3}{8}$	6	$0\frac{5}{8}$	2	$4\frac{3}{8}$	7	$1\frac{1}{8}$	2	$8\frac{3}{8}$	8	$1\frac{3}{4}$	3	$0\frac{3}{8}$	9	$2\frac{3}{8}$
2	$0\frac{1}{2}$	6	1	2	$4\frac{1}{2}$	7	$1\frac{1}{2}$	2	$8\frac{1}{2}$	8	$2\frac{1}{8}$	3	$0\frac{1}{2}$	9	$2\frac{3}{4}$
2	$0\frac{5}{8}$	6	$1\frac{3}{8}$	2	$4\frac{5}{8}$	7	2	2	$8\frac{5}{8}$	8	$2\frac{1}{2}$	3	$0\frac{5}{8}$	9	$3\frac{1}{8}$
2	$0\frac{3}{4}$	6	$1\frac{3}{4}$	2	$4\frac{3}{4}$	7	$2\frac{3}{8}$	2	$8\frac{3}{4}$	8	$2\frac{7}{8}$	3	$0\frac{3}{4}$	9	$3\frac{1}{2}$
2	$0\frac{7}{8}$	6	$2\frac{1}{4}$	2	$4\frac{7}{8}$	7	$2\frac{3}{4}$	2	$8\frac{7}{8}$	8	$3\frac{3}{8}$	3	$0\frac{7}{8}$	9	$3\frac{7}{8}$
2	1	6	$2\frac{5}{8}$	2	5	7	$3\frac{1}{8}$	2	9	8	$3\frac{3}{4}$	3	1	9	$4\frac{1}{4}$
2	$1\frac{1}{8}$	6	3	2	$5\frac{1}{8}$	7	$3\frac{1}{2}$	2	$9\frac{1}{8}$	8	$4\frac{1}{8}$	3	$1\frac{1}{8}$	9	$4\frac{5}{8}$
2	$1\frac{1}{4}$	6	$3\frac{3}{8}$	2	$5\frac{1}{4}$	7	$3\frac{7}{8}$	2	$9\frac{1}{4}$	8	$4\frac{1}{2}$	3	$1\frac{1}{4}$	9	5
2	$1\frac{3}{8}$	6	$3\frac{3}{4}$	2	$5\frac{3}{8}$	7	$4\frac{3}{8}$	2	$9\frac{3}{8}$	8	$4\frac{7}{8}$	3	$1\frac{3}{8}$	9	$5\frac{1}{2}$
2	$1\frac{1}{2}$	6	$4\frac{1}{8}$	2	$5\frac{1}{2}$	7	$4\frac{3}{4}$	2	$9\frac{1}{2}$	8	$5\frac{1}{4}$	3	$1\frac{1}{2}$	9	$5\frac{7}{8}$
2	$1\frac{5}{8}$	6	$4\frac{1}{2}$	2	$5\frac{5}{8}$	7	$5\frac{1}{8}$	2	$9\frac{5}{8}$	8	$5\frac{5}{8}$	3	$1\frac{5}{8}$	9	$6\frac{1}{4}$
2	$1\frac{3}{4}$	6	$4\frac{7}{8}$	2	$5\frac{3}{4}$	7	$5\frac{1}{2}$	2	$9\frac{3}{4}$	8	6	3	$1\frac{3}{4}$	9	$6\frac{5}{8}$
2	$1\frac{7}{8}$	6	$5\frac{3}{8}$	2	$5\frac{7}{8}$	7	$5\frac{7}{8}$	2	$9\frac{7}{8}$	8	$6\frac{1}{2}$	3	$1\frac{7}{8}$	9	7

For Angle Iron measuring $\frac{5}{8}$ of an Inch thick, diagonally across the root.

FLANGE INSIDE.

OUTSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.		OUTSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.		OUTSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.		OUTSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.	
FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN	FT.	IN.	FT.	IN.	FT.	IN.
3	2	9	7 3/8	3	6	10	8	3	10	11	8 1/2	4	2	12	9 1/8
3	2 1/8	9	7 7/8	3	6 1/8	10	8 3/8	3	10 1/8	11	8 7/8	4	2 1/8	12	9 1/2
3	2 1/4	9	8 1/4	3	6 1/4	10	8 3/4	3	10 1/4	11	9 3/8	4	2 1/4	12	9 7/8
3	2 3/8	9	8 5/8	3	6 3/8	10	9 1/8	3	10 3/8	11	9 3/4	4	2 3/8	12	10 3/8
3	2 1/2	9	9	3	6 1/2	10	9 1/2	3	10 1/2	11	10 1/8	4	2 1/2	12	10 3/4
3	2 5/8	9	9 3/8	3	6 5/8	10	9 7/8	3	10 5/8	11	10 1/2	4	2 5/8	12	11 1/8
3	2 3/4	9	9 3/4	3	6 3/4	10	10 1/8	3	10 3/4	11	10 7/8	4	2 3/4	12	11 1/2
3	2 7/8	9	10 1/8	3	6 7/8	10	10 1/2	3	10 7/8	11	11 1/4	4	2 7/8	12	11 7/8
3	3	9	10 1/2	3	7	10	11 1/8	3	11	11	11 5/8	4	3	13	0 1/4
3	3 1/8	9	10 7/8	3	7 1/8	10	11 1/2	3	11 1/8	12	0 1/8	4	3 1/8	13	0 5/8
3	3 1/4	9	11 3/8	3	7 1/4	10	11 7/8	3	11 1/4	12	0 1/2	4	3 1/4	13	1
3	3 3/8	9	11 3/4	3	7 3/8	11	0 3/8	3	11 3/8	12	0 7/8	4	3 3/8	13	1 1/2
3	3 1/2	10	0 1/8	3	7 1/2	11	0 3/4	3	11 1/2	12	1 1/4	4	3 1/2	13	1 7/8
3	3 5/8	10	0 1/2	3	7 5/8	11	1 1/8	3	11 5/8	12	1 5/8	4	3 5/8	13	2 1/4
3	3 3/4	10	0 7/8	3	7 3/4	11	1 1/2	3	11 3/4	12	2	4	3 3/4	13	2 5/8
3	3 7/8	10	1 3/8	3	7 7/8	11	1 7/8	3	11 7/8	12	2 3/8	4	3 7/8	13	3
3	4	10	1 3/4	3	8	11	2 1/4	4	0	12	2 7/8	4	4	13	3 3/8
3	4 1/8	10	2 1/8	3	8 1/8	11	2 5/8	4	0 1/8	12	3 1/4	4	4 1/8	13	3 3/4
3	4 1/4	10	2 1/2	3	8 1/4	11	3	4	0 1/4	12	3 5/8	4	4 1/4	13	4 1/4
3	4 3/8	10	2 7/8	3	8 3/8	11	3 1/2	4	0 3/8	12	4	4	4 3/8	13	4 5/8
3	4 1/2	10	3 1/4	3	8 1/2	11	3 7/8	4	0 1/2	12	4 3/8	4	4 1/2	13	5
3	4 5/8	10	3 5/8	3	8 5/8	11	4 1/4	4	0 5/8	12	4 3/4	4	4 5/8	13	5 3/8
3	4 3/4	10	4	3	8 3/4	11	4 5/8	4	0 3/4	12	5 1/4	4	4 3/4	13	5 3/4
3	4 7/8	10	4 1/2	3	8 7/8	11	5	4	0 7/8	12	5 5/8	4	4 7/8	13	6 1/8
3	5	10	4 7/8	3	9	11	5 3/8	4	1	12	6	4	5	13	6 1/2
3	5 1/8	10	5 1/4	3	9 1/8	11	5 3/4	4	1 1/8	12	6 3/8	4	5 1/8	13	7
3	5 1/4	10	5 5/8	3	9 1/4	11	6 1/4	4	1 1/4	12	6 3/4	4	5 1/4	13	7 3/8
3	5 3/8	10	6	3	9 3/8	11	6 5/8	4	1 3/8	12	7 1/8	4	5 3/8	13	7 3/4
3	5 1/2	10	6 3/8	3	9 1/2	11	7	4	1 1/2	12	7 1/2	4	5 1/2	13	8 1/8
3	5 5/8	10	6 7/8	3	9 5/8	11	7 3/8	4	1 5/8	12	7 3/8	4	5 5/8	13	8 1/2
3	5 3/4	10	7 1/4	3	9 3/4	11	7 3/4	4	1 3/4	12	8 1/8	4	5 3/4	13	8 7/8
3	5 7/8	10	7 5/8	3	9 7/8	11	8 1/8	4	1 7/8	12	8 3/4	4	5 7/8	13	9 1/4

For Angle Iron measuring $\frac{5}{8}$ of an Inch thick, diagonally across the root.

FLANGE INSIDE.

OUTSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.		OUTSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.		OUTSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.		OUTSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.	
FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN
4	6	13	9 5/8	4	10	14	10 1/4	5	2	15	10 7/8	5	6	16	11 3/8
4	6 1/8	13	10 1/8	4	10 1/8	14	10 5/8	5	2 1/8	15	11 1/4	5	6 1/8	16	11 3/4
4	6 1/4	13	10 1/2	4	10 1/4	14	11	5	2 1/4	15	11 5/8	5	6 1/4	17	0 1/8
4	6 3/8	13	10 7/8	4	10 3/8	14	11 1/2	5	2 3/8	16	0	5	6 3/8	17	0 5/8
4	6 1/2	13	11 1/4	4	10 1/2	14	11 7/8	5	2 1/2	16	0 3/8	5	6 1/2	17	1
4	6 5/8	13	11 5/8	4	10 5/8	15	0 1/4	5	2 5/8	16	0 3/4	5	6 5/8	17	1 3/8
4	6 3/4	14	0	4	10 3/4	15	0 5/8	5	2 3/4	16	1 1/8	5	6 3/4	17	1 3/4
4	6 7/8	14	0 3/8	4	10 7/8	15	1	5	2 7/8	16	1 5/8	5	6 7/8	17	2 1/8
4	7	14	0 7/8	4	11	15	1 3/8	5	3	16	2	5	7	17	2 1/2
4	7 1/8	14	1 1/4	4	11 1/8	15	1 7/8	5	3 1/8	16	2 3/8	5	7 1/8	17	2 7/8
4	7 1/4	14	1 5/8	4	11 1/4	15	2 1/4	5	3 1/4	16	2 3/4	5	7 1/4	17	3 3/8
4	7 3/8	14	2	4	11 3/8	15	2 5/8	5	3 3/8	16	3 1/8	5	7 3/8	17	3 3/4
4	7 1/2	14	2 3/8	4	11 1/2	15	3	5	3 1/2	16	3 1/2	5	7 1/2	17	4 1/8
4	7 5/8	14	2 3/4	4	11 5/8	15	3 3/8	5	3 5/8	16	3 7/8	5	7 5/8	17	4 1/2
4	7 3/4	14	3 1/8	4	11 3/4	15	3 3/4	5	3 3/4	16	4 3/8	5	7 3/4	17	4 7/8
4	7 7/8	14	3 1/2	4	11 7/8	15	4 1/8	5	3 7/8	16	4 3/4	5	7 7/8	17	5 1/4
4	8	14	4	5	0	15	4 1/2	5	4	16	5 1/8	5	8	17	5 5/8
4	8 1/8	14	4 3/8	5	0 1/8	15	4 7/8	5	4 1/8	16	5 1/2	5	8 1/8	17	6
4	8 1/4	14	4 3/4	5	0 1/4	15	5 3/8	5	4 1/4	16	5 7/8	5	8 1/4	17	6 1/2
4	8 3/8	14	5 1/8	5	0 3/8	15	5 3/4	5	4 3/8	16	6 1/4	5	8 3/8	17	6 7/8
4	8 1/2	14	5 1/2	5	0 1/2	15	6 1/8	5	4 1/2	16	6 5/8	5	8 1/2	17	7 1/4
4	8 5/8	14	5 7/8	5	0 5/8	15	6 1/2	5	4 5/8	16	7	5	8 5/8	17	7 5/8
4	8 3/4	14	6 3/8	5	0 3/4	15	6 7/8	5	4 3/4	16	7 1/2	5	8 3/4	17	8
4	8 7/8	14	6 3/4	5	0 7/8	15	7 1/4	5	4 7/8	16	7 7/8	5	8 7/8	17	8 3/8
4	9	14	7 1/8	5	1	15	7 3/4	5	5	16	8 1/4	5	9	17	8 7/8
4	9 1/8	14	7 1/2	5	1 1/8	15	8 1/8	5	5 1/8	16	8 5/8	5	9 1/8	17	9 1/4
4	9 1/4	14	7 7/8	5	1 1/4	15	8 1/2	5	5 1/4	16	9	5	9 1/4	17	9 5/8
4	9 3/8	14	8 1/4	5	1 3/8	15	8 7/8	5	5 3/8	16	9 3/8	5	9 3/8	17	10
4	9 1/2	14	8 3/4	5	1 1/2	15	9 1/4	5	5 1/2	16	9 7/8	5	9 1/2	17	10 3/8
4	9 5/8	14	9 1/8	5	1 5/8	15	9 5/8	5	5 5/8	16	10 1/4	5	9 5/8	17	10 3/4
4	9 3/4	14	9 1/2	5	1 3/4	15	10	5	5 3/4	16	10 5/8	5	9 3/4	17	11 1/8
4	9 7/8	14	9 7/8	5	1 7/8	15	10 3/8	5	5 7/8	16	11	5	9 7/8	17	11 1/2

For ANGLE IRON measuring ⅝ of an Inch thick, diagonally across the root.

FLANGE INSIDE.

OUTSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.		OUTSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.		OUTSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.		OUTSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.	
FT.	IN.	FT.	IN.	FT	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN
5	10	18	0	6	2	19	0½	6	6	20	1⅛	6	10	21	1⅝
5	10⅛	18	0⅜	6	2⅛	19	0⅞	6	6⅛	20	1½	6	10⅛	21	2
5	10¼	18	0¾	6	2¼	19	1⅜	6	6¼	20	1⅞	6	10¼	21	2½
5	10⅜	18	1⅛	6	2⅜	19	1¾	6	6⅜	20	2¼	6	10⅜	21	2⅞
5	10½	18	1½	6	2½	19	2⅛	6	6½	20	2⅝	6	10½	21	3¼
5	10⅝	18	1⅞	6	2⅝	19	2½	6	6⅝	20	3	6	10⅝	21	3⅝
5	10¾	18	2⅜	6	2¾	19	2⅞	6	6¾	20	3½	6	10¾	21	4
5	10⅞	18	2¾	6	2⅞	19	3¼	6	6⅞	20	3⅞	6	10⅞	21	4⅜
5	11	18	3⅛	6	3	19	3⅝	6	7	20	4¼	6	11	21	4¾
5	11⅛	18	3½	6	3⅛	19	4	6	7⅛	20	4⅝	6	11⅛	21	5⅛
5	11¼	18	3⅞	6	3¼	19	4½	6	7¼	20	5	6	11¼	21	5½
5	11⅜	18	4¼	6	3⅜	19	4⅞	6	7⅜	20	5⅜	6	11⅜	21	6
5	11½	18	4⅝	6	3½	19	5¼	6	7½	20	5⅞	6	11½	21	6⅜
5	11⅝	18	5	6	3⅝	19	5⅝	6	7⅝	20	6¼	6	11⅝	21	6¾
5	11¾	18	5½	6	3¾	19	6	6	7¾	20	6⅝	6	11¾	21	7⅛
5	11⅞	18	5⅞	6	3⅞	19	6⅜	6	7⅞	20	7	6	11⅞	21	7⅝
6	0	18	6¼	6	4	19	6⅞	6	8	20	7⅜	7	0	21	8
6	0⅛	18	6⅝	6	4⅛	19	7¼	6	8⅛	20	7¾	7	0⅛	21	8⅜
6	0¼	18	7	6	4¼	19	7⅝	6	8¼	20	8⅛	7	0¼	21	8¾
6	0⅜	18	7⅜	6	4⅜	19	8	6	8⅜	20	8½	7	0⅜	21	9⅛
6	0½	18	7⅞	6	4½	19	8⅜	6	8½	20	9	7	0½	21	9½
6	0⅝	18	8¼	6	4⅝	19	8¾	6	8⅝	20	9⅜	7	0⅝	21	9⅞
6	0¾	18	8⅝	6	4¾	19	9¼	6	8¾	20	9¾	7	0¾	21	10⅜
6	0⅞	18	9	6	4⅞	19	9⅝	6	8⅞	20	10⅛	7	0⅞	21	10¾
6	1	18	9⅜	6	5	19	10	6	9	20	10½	7	1	21	11⅛
6	1⅛	18	9¾	6	5⅛	19	10⅜	6	9⅛	20	10⅞	7	1⅛	21	11½
6	1¼	18	10⅛	6	5¼	19	10¾	6	9¼	20	11⅜	7	1¼	21	11⅞
6	1⅜	18	10½	6	5⅜	19	11⅛	6	9⅜	20	11¾	7	1⅜	22	0¼
6	1½	18	11	6	5½	19	11½	6	9½	21	0⅛	7	1½	22	0⅝
6	1⅝	18	11⅜	6	5⅝	19	11⅞	6	9⅝	21	0½	7	1⅝	22	1
6	1¾	18	11¾	6	5¾	20	0⅜	6	9¾	21	0⅞	7	1¾	22	1½
6	1⅞	19	0⅛	6	5⅞	20	0¾	6	9⅞	21	1¼	7	1⅞	22	1⅞

For Angle Iron measuring ⅜ of an Inch thick, diagonally across the root

FLANGE INSIDE.

OUTSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.		OUTSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.		OUTSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.		OUTSIDE DIAMETE OF RING		LENGTH REQUIRED FOR RING.	
FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN	FT.	IN
7	2	22	2¼	7	6	23	2¾	7	10	24	3⅜	8	2	25	3⅞
7	2⅛	22	2⅝	7	6⅛	23	3¼	7	10⅛	24	3¾	8	2¼	25	4⅜
7	2¼	22	3	7	6¼	23	3⅝	7	10¼	24	4⅛	8	2¼	25	4¾
7	2⅜	22	3⅜	7	6⅜	23	4	7	10⅜	24	4½	8	2⅜	25	5⅛
7	2½	22	3⅞	7	6½	23	4⅜	7	10½	24	4⅞	8	2½	25	5½
7	2⅝	22	4¼	7	6⅝	23	4¾	7	10⅝	24	5⅜	8	2⅝	25	5⅞
7	2¾	22	4⅝	7	6¾	23	5⅛	7	10¾	24	5¾	8	2¾	25	6¼
7	2⅞	22	5	7	6⅞	23	5½	7	10⅞	24	6⅛	8	2⅞	25	6⅝
7	3	22	5⅜	7	7	23	6	7	11	24	6½	8	3	25	7
7	3⅛	22	5¾	7	7⅛	23	6⅜	7	11⅛	24	6⅞	8	3⅛	25	7½
7	3¼	22	6⅛	7	7¼	23	6¾	7	11¼	24	7¼	8	3¼	25	7⅞
7	3⅜	22	6½	7	7⅜	23	7⅛	7	11¾	24	7⅝	8	3¾	25	8¼
7	3½	22	7	7	7½	23	7½	7	11½	24	8	8	3½	25	8⅝
7	3⅝	22	7⅜	7	7⅝	23	7⅞	7	11⅝	24	8½	8	3⅝	25	9
7	3¾	22	7¾	7	7¾	23	8¼	7	11¾	24	8⅞	8	3¾	25	9½
7	3⅞	22	8⅛	7	7⅞	23	8¾	7	11⅞	24	9¼	8	3⅞	25	9⅞
7	4	22	8½	7	8	23	9⅛	8	0	24	9⅝	8	4	25	10¼
7	4⅛	22	8⅞	7	8⅛	23	9½	8	0⅛	24	10	8	4⅛	25	10⅝
7	4¼	22	9¼	7	8¼	23	9⅞	8	0¼	24	10½	8	4¼	25	11
7	4⅜	22	9¾	7	8⅜	23	10¼	8	0⅜	24	10⅞	8	4⅜	25	11⅜
7	4½	22	10⅛	7	8½	23	10⅝	8	0½	24	11¼	8	4½	25	11¾
7	4⅝	22	10½	7	8⅝	23	11	8	0⅝	24	11⅝	8	4⅝	26	0⅛
7	4¾	22	10⅞	7	8¾	23	11½	8	0¾	25	0	8	4¾	26	0⅝
7	4⅞	22	11¼	7	8⅞	23	11⅞	8	0⅞	25	0⅜	8	4⅞	26	1
7	5	22	11⅝	7	9	24	0¼	8	1	25	0¾	8	5	26	1⅜
7	5⅛	23	0	7	9⅛	24	0⅝	8	1⅛	25	1¼	8	5⅛	26	1¾
7	5¼	23	0½	7	9¼	24	1	8	1¼	25	1⅝	8	5¼	26	2⅛
7	5⅜	23	0⅞	7	9⅜	24	1⅜	8	1⅜	25	2	8	5⅜	26	2½
7	5½	23	1¼	7	9½	24	1¾	8	1½	25	2⅜	8	5½	26	2⅞
7	5⅝	23	1⅝	7	9⅝	24	2¼	8	1⅝	25	2¾	8	5⅝	26	3⅜
7	5¾	23	2	7	9¾	24	2⅝	8	1¾	25	3⅛	8	5¾	26	3¾
7	5⅞	23	2⅜	7	9⅞	24	3	8	1⅞	25	3½	8	5⅞	26	4⅛

TABLE XIV.

For Angle Iron measuring ¾ of an Inch thick, diagonally across the root,

FLANGE INSIDE.

OUTSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.		OUTSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.		OUTSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.		OUTSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.	
FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.
0	9	1	11½	1	1	3	0⅛	1	5	4	0⅝	1	9	5	1¼
0	9⅛	1	11⅞	1	1⅛	3	0½	1	5⅛	4	1	1	9⅛	5	1⅝
0	9¼	2	0⅜	1	1¼	3	0⅞	1	5¼	4	1⅜	1	9¼	5	2
0	9⅜	2	0¾	1	1⅜	3	1¼	1	5⅜	4	1⅞	1	9⅜	5	2⅜
0	9½	2	1⅛	1	1½	3	1⅝	1	5½	4	2¼	1	9½	5	2¾
0	9⅝	2	1½	1	1⅝	3	2	1	5⅝	4	2⅝	1	9⅝	5	3⅛
0	9¾	2	1⅞	1	1¾	3	2½	1	5¾	4	3	1	9¾	5	3⅝
0	9⅞	2	2⅜	1	1⅞	3	2⅞	1	5⅞	4	3⅜	1	9⅞	5	4
0	10	2	2¾	1	2	3	3¼	1	6	4	3¾	1	10	5	4⅜
0	10⅛	2	3⅛	1	2⅛	3	3⅝	1	6⅛	4	4⅛	1	10⅛	5	4¾
0	10¼	2	3½	1	2¼	3	4	1	6¼	4	4½	1	10¼	5	5⅛
0	10⅜	2	3⅞	1	2⅜	3	4⅜	1	6⅜	4	5	1	10⅜	5	5½
0	10½	2	4¼	1	2½	3	4⅞	1	6½	4	5⅜	1	10½	5	5⅞
0	10⅝	2	4⅝	1	2⅝	3	5¼	1	6⅝	4	5¾	1	10⅝	5	6⅜
0	10¾	2	5	1	2¾	3	5⅝	1	6¾	4	6⅛	1	10¾	5	6¾
0	10⅞	2	5½	1	2⅞	3	6	1	6⅞	4	6½	1	10⅞	5	7⅛
0	11	2	5⅞	1	3	3	6⅜	1	7	4	7	1	11	5	7½
0	11⅛	2	6¼	1	3⅛	3	6¾	1	7⅛	4	7⅜	1	11⅛	5	8
0	11¼	2	6⅝	1	3¼	3	7⅛	1	7¼	4	7¾	1	11¼	5	8⅜
0	11⅜	2	7	1	3⅜	3	7⅝	1	7⅜	4	8⅛	1	11⅜	5	8¾
0	11½	2	7⅜	1	3½	3	8	1	7½	4	8½	1	11½	5	9⅛
0	11⅝	2	7¾	1	3⅝	3	8⅜	1	7⅝	4	8⅞	1	11⅝	5	9½
0	11¾	2	8¼	1	3¾	3	8¾	1	7¾	4	9¼	1	11¾	5	9⅞
0	11⅞	2	8⅝	1	3⅞	3	9⅛	1	7⅞	4	9⅝	1	11⅞	5	10¼
1	0	2	9	1	4	3	9½	1	8	4	10⅛	2	0	5	10⅝
1	0⅛	2	9⅜	1	4⅛	3	9⅞	1	8⅛	4	10½	2	0⅛	5	11
1	0¼	2	9¾	1	4¼	3	10⅜	1	8¼	4	10⅞	2	0¼	5	11½
1	0⅜	2	10⅛	1	4⅜	3	10¾	1	8⅜	4	11¼	2	0⅜	5	11⅞
1	0½	2	10½	1	4½	3	11⅛	1	8½	4	11⅝	2	0½	6	0¼
1	0⅝	2	10⅞	1	4⅝	3	11½	1	8⅝	5	0	2	0⅝	6	0⅝
1	0¾	2	11⅜	1	4¾	3	11⅞	1	8¾	5	0⅜	2	0¾	6	1
1	0⅞	2	11¾	1	4⅞	4	0¼	1	8⅞	5	0⅞	2	0⅞	6	1⅜

For Angle Iron measuring ¾ of an Inch thick, diagonally across the root.

FLANGE INSIDE.

OUTSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.		OUTSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.		OUTSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.		OUTSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.	
FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.
2	1	6	1¾	2	5	7	2⅜	2	9	8	2⅞	3	1	9	3½
2	1⅛	6	2¼	2	5⅛	7	2¾	2	9⅛	8	3⅜	3	1⅛	9	3⅞
2	1¼	6	2⅝	2	5¼	7	3⅛	2	9¼	8	3¾	3	1¼	9	4¼
2	1⅜	6	3	2	5⅜	7	3½	2	9⅜	8	4⅛	3	1⅜	9	4⅝
2	1½	6	3⅜	2	5½	7	3⅞	2	9½	8	4½	3	1½	9	5
2	1⅝	6	3¾	2	5⅝	7	4⅜	2	9⅝	8	4⅞	3	1⅝	9	5½
2	1¾	6	4⅛	2	5¾	7	4¾	2	9¾	8	5¼	3	1¾	9	5⅞
2	1⅞	6	4½	2	5⅞	7	5⅛	2	9⅞	8	5⅝	3	1⅞	9	6¼
2	2	6	4⅞	2	6	7	5½	2	10	8	6	3	2	9	6⅝
2	2⅛	6	5⅜	2	6⅛	7	5⅞	2	10⅛	8	6½	3	2⅛	9	7
2	2¼	6	5¾	2	6¼	7	6¼	2	10¼	8	6⅞	3	2¼	9	7⅜
2	2⅜	6	6⅛	2	6⅜	7	6⅝	2	10⅜	8	7¼	3	2⅜	9	7⅞
2	2½	6	6½	2	6½	7	7	2	10½	8	7⅝	3	2½	9	8¼
2	2⅝	6	6⅞	2	6⅝	7	7½	2	10⅝	8	8	3	2⅝	9	8⅝
2	2¾	6	7¼	2	6¾	7	7⅞	2	10¾	8	8⅜	3	2¾	9	9
2	2⅞	6	7⅝	2	6⅞	7	8¼	2	10⅞	8	8⅞	3	2⅞	9	9⅜
2	3	6	8⅛	2	7	7	8⅝	2	11	8	9¼	3	3	9	9¾
2	3⅛	6	8½	2	7⅛	7	9	2	11⅛	8	9⅝	3	3⅛	9	10⅛
2	3¼	6	8⅞	2	7¼	7	9⅜	2	11¼	8	10	3	3¼	9	10½
2	3⅜	6	9¼	2	7⅜	7	9¾	2	11⅜	8	10⅜	3	3⅜	9	10⅞
2	3½	6	9⅝	2	7½	7	10¼	2	11½	8	10¾	3	3½	9	11⅜
2	3⅝	6	10	2	7⅝	7	10⅝	2	11⅝	8	11⅛	3	3⅝	9	11¾
2	3¾	6	10½	2	7¾	7	11	2	11¾	8	11½	3	3¾	10	0⅛
2	3⅞	6	10⅞	2	7⅞	7	11⅜	2	11⅞	9	0	3	3⅞	10	0½
2	4	6	11¼	2	8	7	11¾	3	0	9	0⅜	3	4	10	0⅞
2	4⅛	6	11⅝	2	8⅛	8	0⅛	3	0⅛	9	0¾	3	4⅛	10	1⅜
2	4¼	7	0	2	8¼	8	0½	3	0¼	9	1⅛	3	4¼	10	1¾
2	4⅜	7	0⅜	2	8⅜	8	1	3	0⅜	9	1½	3	4⅜	10	2⅛
2	4½	7	0¾	2	8½	8	1⅜	3	0½	9	1⅞	3	4½	10	2½
2	4⅝	7	1⅛	2	8⅝	8	1¾	3	0⅝	9	2⅜	3	4⅝	10	2⅞
2	4¾	7	1½	2	8¾	8	2⅛	3	0¾	9	2¾	3	4¾	10	3¼
2	4⅞	7	2	2	8⅞	8	2½	3	0⅞	9	3⅛	3	4⅞	10	3⅝

For Angle Iron measuring ¾ of an Inch thick, diagonally across the root.

FLANGE INSIDE.

OUTSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.		OUTSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.		OUTSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.		OUTSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.	
FT.	IN	FT.	IN.	FT.	IN.	FT.	IN.	FT	IN	FT.	IN.	FT.	IN.	FT.	IN.
3	5	10	4	3	9	11	4⅝	4	1	12	5¼	4	5	13	5¾
3	5⅛	10	4½	3	9⅛	11	5	4	1⅛	12	5⅝	4	5⅛	13	6⅛
3	5¼	10	4⅞	3	9¼	11	5⅜	4	1¼	12	6	4	5¼	13	6½
3	5⅜	10	5¼	3	9⅜	11	5¾	4	1⅜	12	6⅜	4	5⅜	13	7
3	5½	10	5⅝	3	9½	11	6¼	4	1½	12	6¾	4	5½	13	7⅜
3	5⅝	10	6	3	9⅝	11	6⅝	4	1⅝	12	7¼	4	5⅝	13	7¾
3	5¾	10	6⅜	3	9¾	11	7	4	1¾	12	7½	4	5¾	13	8⅛
3	5⅞	10	6⅞	3	9⅞	11	7⅜	4	1⅞	12	7⅞	4	5⅞	13	8½
3	6	10	7¼	3	10	11	7¾	4	2	12	8⅜	4	6	13	8⅞
3	6⅛	10	7⅝	3	10⅛	11	8⅛	4	2⅛	12	8¾	4	6⅛	13	9¼
3	6¼	10	8	3	10¼	11	8½	4	2¼	12	9⅛	4	6¼	13	9⅝
3	6⅜	10	8⅜	3	10⅜	11	8⅞	4	2⅜	12	9½	4	6⅜	13	10⅛
3	6½	10	8¾	3	10½	11	9⅜	4	2½	12	9⅞	4	6½	13	10½
3	6⅝	10	9⅛	3	10⅝	11	9¾	4	2⅝	12	10⅜	4	6⅝	13	10⅞
3	6¾	10	9½	3	10¾	11	10⅛	4	2¾	12	10¾	4	6¾	13	11¼
3	6⅞	10	9⅞	3	10⅞	11	10½	4	2⅞	12	11⅛	4	6⅞	13	11⅝
3	7	10	10⅜	3	11	11	10⅞	4	3	12	11½	4	7	14	0
3	7⅛	10	10¾	3	11⅛	11	11¼	4	3⅛	12	11⅞	4	7⅛	14	0⅜
3	7¼	10	11⅛	3	11¼	11	11⅝	4	3¼	13	0¼	4	7¼	14	0⅞
3	7⅜	10	11½	3	11⅜	12	0⅛	4	3⅜	13	0⅝	4	7⅜	14	1¼
3	7½	10	11⅞	3	11½	12	0½	4	3½	13	1	4	7½	14	1⅝
3	7⅝	11	0⅜	3	11⅝	12	0⅞	4	3⅝	13	1½	4	7⅝	14	2
3	7¾	11	0¾	3	11¾	12	1¼	4	3¾	13	1⅞	4	7¾	14	2⅜
3	7⅞	11	1⅛	3	11⅞	12	1⅝	4	3⅞	13	2¼	4	7⅞	14	2¾
3	8	11	1½	4	0	12	2	4	4	13	2⅝	4	8	14	3⅛
3	8⅛	11	1⅞	4	0⅛	12	2⅜	4	4⅛	13	3	4	8⅛	14	3½
3	8¼	11	2¼	4	0¼	12	2⅞	4	4¼	13	3⅜	4	8¼	14	4
3	8⅜	11	2⅝	4	0⅜	12	3¼	4	4⅜	13	3¾	4	8⅜	14	4⅜
3	8½	11	3	4	0½	12	3⅝	4	4½	13	4¼	4	8½	14	4¾
3	8⅝	11	3½	4	0⅝	12	4	4	4⅝	13	4⅝	4	8⅝	14	5⅛
3	8¾	11	3⅞	4	0¾	12	4⅜	4	4¾	13	5	4	8¾	14	5½
3	8⅞	11	4¼	4	0⅞	12	4¾	4	4⅞	13	5⅜	4	8⅞	14	5⅞

For Angle Iron measuring $\frac{3}{4}$ of an Inch thick, diagonally across the root.

FLANGE INSIDE.

OUTSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.		OUTSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.		OUTSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.		OUTSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.	
FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.
4	9	14	6 3/8	5	1	15	6 7/8	5	5	16	7 1/2	5	9	17	8
4	9 1/8	14	6 3/4	5	1 1/8	15	7 1/4	5	5 1/8	16	7 7/8	5	9 1/8	17	8 3/8
4	9 1/4	14	7 1/8	5	1 1/4	15	7 3/4	5	5 1/4	16	8 1/4	5	9 1/4	17	8 7/8
4	9 3/8	14	7 1/2	5	1 3/8	15	8	5	5 3/8	16	8 5/8	5	9 3/8	17	9 1/4
4	9 1/2	14	7 7/8	5	1 1/2	15	8 1/2	5	5 1/2	16	9	5	9 1/2	17	9 5/8
4	9 5/8	14	8 1/4	5	1 5/8	15	8 7/8	5	5 5/8	16	9 3/8	5	9 5/8	17	10
4	9 3/4	14	8 3/4	5	1 3/4	15	9	5	5 3/4	16	9 7/8	5	9 3/4	17	10 3/8
4	9 7/8	14	9 1/8	5	1 7/8	15	9 5/8	5	5 7/8	16	10 1/4	5	9 7/8	17	10 3/4
4	10	14	9 1/2	5	2	15	10	5	6	16	10 5/8	5	10	17	11 1/8
4	10 1/8	14	9 7/8	5	2 1/8	15	10 3/8	5	6 1/8	16	11	5	10 1/8	17	11 1/2
4	10 1/4	14	10 1/4	5	2 1/4	15	10 7/8	5	6 1/4	16	11 3/8	5	10 1/4	18	0
4	10 3/8	14	10 5/8	5	2 3/8	15	11 1/4	5	6 3/8	16	11 3/4	5	10 3/8	18	0 3/8
4	10 1/2	14	11	5	2 1/2	15	11 7/8	5	6 1/2	17	0 1/8	5	10 1/2	18	0 3/4
4	10 5/8	14	11 1/2	5	2 5/8	16	0	5	6 5/8	17	0 5/8	5	10 5/8	18	1 1/8
4	10 3/4	14	11 7/8	5	2 3/4	16	0 3/8	5	6 3/4	17	1	5	10 3/4	18	1 1/2
4	10 7/8	15	0 1/4	5	2 7/8	16	0 3/4	5	6 7/8	17	1 3/8	5	10 7/8	18	1 7/8
4	11	15	0 5/8	5	3	16	1 1/8	5	7	17	1 3/4	5	11	18	2 3/8
4	11 1/8	15	1	5	3 1/8	16	1 5/8	5	7 1/8	17	2 1/8	5	11 1/8	18	2 3/4
4	11 1/4	15	1 3/8	5	3 1/4	16	2	5	7 1/4	17	2 1/2	5	11 1/4	18	3 1/8
4	11 3/8	15	1 7/8	5	3 3/8	16	2 3/8	5	7 3/8	17	2 7/8	5	11 3/8	18	3 1/2
4	11 1/2	15	2 1/4	5	3 1/2	16	2 3/4	5	7 1/2	17	3 3/8	5	11 1/2	18	3 7/8
4	11 5/8	15	2 5/8	5	3 5/8	16	3 1/8	5	7 5/8	17	3 3/4	5	11 5/8	18	4 1/8
4	11 3/4	15	3	5	3 3/4	16	3 1/2	5	7 3/4	17	4 1/8	5	11 3/4	18	4 5/8
4	11 7/8	15	3 3/8	5	3 7/8	16	3 7/8	5	7 7/8	17	4 1/2	5	11 7/8	18	5
5	0	15	3 3/4	5	4	16	4 3/8	5	8	17	4 7/8	6	0	18	5 1/2
5	0 1/8	15	4 1/8	5	4 1/8	16	4 3/4	5	8 1/8	17	5 1/4	6	0 1/8	18	5 7/8
5	0 1/4	15	4 1/2	5	4 1/4	16	5 1/8	5	8 1/4	17	5 5/8	6	0 1/4	18	6 1/4
5	0 3/8	15	4 7/8	5	4 3/8	16	5 1/2	5	8 3/8	17	6	6	0 3/8	18	6 5/8
5	0 1/2	15	5 3/8	5	4 1/2	16	5 7/8	5	8 1/2	17	6 1/2	6	0 1/2	18	7
5	0 5/8	15	5 3/4	5	4 5/8	16	6 1/4	5	8 5/8	17	6 7/8	6	0 5/8	18	7 3/8
5	0 3/4	15	6 1/8	5	4 3/4	16	6 5/8	5	8 3/4	17	7 1/4	6	0 3/4	18	7 7/8
5	0 7/8	15	6 1/2	5	4 7/8	16	7	5	8 7/8	17	7 5/8	6	0 7/8	18	8 1/4

For Angle Iron measuring $\frac{3}{4}$ of an Inch thick, diagonally across the root.

FLANGE INSIDE.

OUTSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.		OUTSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.		OUTSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.		OUTSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.	
FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.
6	1	18	8 5/8	6	5	19	9 1/8	6	9	20	9 3/4	7	1	21	10 3/8
6	1 1/8	18	9	6	5 1/8	19	9 5/8	6	9 1/8	20	10 1/8	7	1 1/8	21	10 3/4
6	1 1/4	18	9 3/8	6	5 1/4	19	10	6	9 1/4	20	10 1/2	7	1 1/4	21	11 1/8
6	1 3/8	18	9 3/4	6	5 3/8	19	10 3/8	6	9 3/8	20	10 7/8	7	1 3/8	21	11 1/2
6	1 1/2	18	10 1/8	6	5 1/2	19	10 3/4	6	9 1/2	20	11 3/8	7	1 1/2	21	11 7/8
6	1 5/8	18	10 1/2	6	5 5/8	19	11 1/8	6	9 5/8	20	11 3/4	7	1 5/8	22	0 1/4
6	1 3/4	18	11	6	5 3/4	19	11 1/2	6	9 3/4	21	0 1/8	7	1 3/4	22	0 5/8
6	1 7/8	18	11 3/8	6	5 7/8	19	11 7/8	6	9 7/8	21	0 1/2	7	1 7/8	22	1
6	2	18	11 3/4	6	6	20	0 3/8	6	10	21	0 7/8	7	2	22	1 1/2
6	2 1/8	19	0 1/8	6	6 1/8	20	0 3/4	6	10 1/8	21	1 1/4	7	2 1/8	22	1 7/8
6	2 1/4	19	0 1/2	6	6 1/4	20	1 1/8	6	10 1/4	21	1 5/8	7	2 1/4	22	2 1/4
6	2 3/8	19	0 7/8	6	6 3/8	20	1 1/2	6	10 3/8	21	2	7	2 3/8	22	2 5/8
6	2 1/2	19	1 3/8	6	6 1/2	20	1 7/8	6	10 1/2	21	2 1/2	7	2 1/2	22	3
6	2 5/8	19	1 3/4	6	6 5/8	20	2 1/4	6	10 5/8	21	2 7/8	7	2 5/8	22	3 3/8
6	2 3/4	19	2 1/8	6	6 3/4	20	2 5/8	6	10 3/4	21	3 1/4	7	2 3/4	22	3 7/8
6	2 7/8	19	2 1/2	6	6 7/8	20	3	6	10 7/8	21	3 5/8	7	2 7/8	22	4 1/4
6	3	19	2 7/8	6	7	20	3 1/2	6	11	21	4	7	3	22	4 5/8
6	3 1/8	19	3 1/4	6	7 1/8	20	3 7/8	6	11 1/8	21	4 3/8	7	3 1/8	22	5
6	3 1/4	19	3 5/8	6	7 1/4	20	4 1/4	6	11 1/4	21	4 3/4	7	3 1/4	22	5 3/8
6	3 3/8	19	4	6	7 3/8	20	4 5/8	6	11 3/8	21	5 1/8	7	3 3/8	22	5 3/4
6	3 1/2	19	4 1/2	6	7 1/2	20	5	6	11 1/2	21	5 1/2	7	3 1/2	22	6 1/8
6	3 5/8	19	4 7/8	6	7 5/8	20	5 3/8	6	11 5/8	21	6	7	3 5/8	22	6 1/2
6	3 3/4	19	5 1/4	6	7 3/4	20	5 7/8	6	11 3/4	21	6 3/8	7	3 3/4	22	7
6	3 7/8	19	5 5/8	6	7 7/8	20	6 1/4	6	11 7/8	21	6 3/4	7	3 7/8	22	7 3/8
6	4	19	6	6	8	20	6 5/8	7	0	21	7 1/8	7	4	22	7 3/4
6	4 1/8	19	6 3/8	6	8 1/8	20	7	7	0 1/8	21	7 5/8	7	4 1/8	22	8 1/8
6	4 1/4	19	6 7/8	6	8 1/4	20	7 3/8	7	0 1/4	21	8	7	4 1/4	22	8 1/2
6	4 3/8	19	7 1/4	6	8 3/8	20	7 3/4	7	0 3/8	21	8 3/8	7	4 3/8	22	8 7/8
6	4 1/2	19	7 5/8	6	8 1/2	20	8 1/8	7	0 1/2	21	8 3/4	7	4 1/2	22	9 1/4
6	4 5/8	19	8	6	8 5/8	20	8 1/2	7	0 5/8	21	9 1/8	7	4 5/8	22	9 3/4
6	4 3/4	19	8 3/8	6	8 3/4	20	9	7	0 3/4	21	9 1/2	7	4 3/4	22	10 1/8
6	4 7/8	19	8 3/4	6	8 7/8	20	9 3/8	7	0 7/8	21	9 7/8	7	4 7/8	22	10 1/2

For Angle Iron measuring $\frac{3}{4}$ of an Inch thick, diagonally across the root.

FLANGE INSIDE.

OUTSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.		OUTSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.		OUTSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.		OUTSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.	
FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.
7	5	22	10 7/8	7	9	23	11 1/2	8	1	25	0	8	5	26	0 5/8
7	5 1/8	22	11 1/4	7	9 1/8	23	11 7/8	8	1 1/8	25	0 3/8	8	5 1/8	26	1
7	5 1/4	22	11 5/8	7	9 1/4	23	0 1/4	8	1 1/4	25	0 3/4	8	5 1/4	26	1 3/8
7	5 3/8	23	0	7	9 3/8	23	0 5/8	8	1 3/8	25	1 1/4	8	5 3/8	26	1 3/4
7	5 1/2	23	0 1/2	7	9 1/2	24	1	8	1 1/2	25	1 5/8	8	5 1/2	26	2 1/8
7	5 5/8	23	0 7/8	7	9 5/8	24	1 3/8	8	1 5/8	25	2	8	5 5/8	26	2 1/2
7	5 3/4	23	1 1/4	7	9 3/4	24	1 3/4	8	1 3/4	25	2 3/8	8	5 3/4	26	2 7/8
7	5 7/8	23	1 5/8	7	9 7/8	24	2 1/4	8	1 7/8	25	2 3/4	8	5 7/8	26	3 3/8
7	6	23	2	7	10	24	2 5/8	8	2	25	3 1/8	8	6	26	3 3/4
7	6 1/8	23	2 3/8	7	10 1/8	24	3	8	2 1/8	25	3 1/2	8	6 1/8	26	4 1/8
7	6 1/4	23	2 3/4	7	10 1/4	24	3 3/8	8	2 1/4	25	3 7/8	8	6 1/4	26	4 1/2
7	6 3/8	23	3 1/4	7	10 3/8	24	3 3/4	8	2 3/8	25	4 3/8	8	6 3/8	26	4 7/8
7	6 1/2	23	3 5/8	7	10 1/2	24	4 1/8	8	2 1/2	25	4 3/4	8	6 1/2	26	5 1/4
7	6 5/8	23	4	7	10 5/8	24	4 1/2	8	2 5/8	25	5 1/8	8	6 5/8	26	5 5/8
7	6 3/4	23	4 3/8	7	10 3/4	24	4 7/8	8	2 3/4	25	5 1/2	8	6 3/4	26	6
7	6 7/8	23	4 3/4	7	10 7/8	24	5 3/8	8	2 7/8	25	5 7/8	8	6 7/8	26	6 1/2
7	7	23	5 1/8	7	11	24	5 3/4	8	3	25	6 1/4	8	7	26	6 7/8
7	7 1/8	23	5 1/2	7	11 1/8	24	6 1/8	8	3 1/8	25	6 5/8	8	7 1/8	26	7 1/4
7	7 1/4	23	6	7	11 1/4	24	6 1/2	8	3 1/4	25	7	8	7 1/4	26	7 5/8
7	7 3/8	23	6 3/8	7	11 3/8	24	6 7/8	8	3 3/8	25	7 1/2	8	7 3/8	26	8
7	7 1/2	23	6 3/4	7	11 1/2	24	7 1/4	8	3 1/2	25	7 7/8	8	7 1/2	26	8 3/8
7	7 5/8	23	7 1/8	7	11 5/8	24	7 5/8	8	3 5/8	25	8 1/4	8	7 5/8	26	8 7/8
7	7 3/4	23	7 1/2	7	11 3/4	24	8	8	3 3/4	25	8 5/8	8	7 3/4	26	9 1/4
7	7 7/8	23	7 7/8	7	11 7/8	24	8 1/2	8	3 7/8	25	9	8	7 7/8	26	9 5/8
7	8	23	8 1/4	8	0	24	8 7/8	8	4	25	9 1/2	8	8	26	10
7	8 1/8	23	8 3/4	8	0 1/8	24	9 1/4	8	4 1/8	25	9 7/8	8	8 1/8	26	10 3/8
7	8 1/4	23	9 1/8	8	0 1/4	24	9 5/8	8	4 1/4	25	10 1/4	8	8 1/4	26	10 3/4
7	8 3/8	23	9 1/2	8	0 3/8	24	10	8	4 3/8	25	10 5/8	8	8 3/8	26	11 1/8
7	8 1/2	23	9 7/8	8	0 1/2	24	10 1/2	8	4 1/2	25	11	8	8 1/2	26	11 1/2
7	8 5/8	23	10 1/4	8	0 5/8	24	10 7/8	8	4 5/8	25	11 3/8	8	8 5/8	27	0
7	8 3/4	23	10 5/8	8	0 3/4	24	11 1/4	8	4 3/4	25	11 3/4	8	8 3/4	27	0 3/8
7	8 7/8	23	11	8	0 7/8	24	11 5/8	8	4 7/8	26	0 1/8	8	8 7/8	27	0 3/4

TABLE XV.

For Angle Iron measuring $\frac{7}{8}$ of an Inch thick, diagonally across the root.

FLANGE INSIDE.

OUTSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.		OUTSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.		OUTSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.		OUTSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.	
FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.
0	9	1	10¾	1	1	2	11⅜	1	5	3	11⅞	1	9	5	0⅜
0	9⅛	1	11⅛	1	1⅛	2	11¾	1	5⅛	4	0¼	1	9⅛	5	0⅞
0	9¼	1	11½	1	1¼	3	0⅛	1	5¼	4	0⅝	1	9¼	5	1¼
0	9⅜	1	11⅞	1	1⅜	3	0½	1	5⅜	4	1	1	9⅜	5	1⅝
0	9½	2	0⅜	1	1½	3	0⅞	1	5½	4	1⅜	1	9½	5	2
0	9⅝	2	0¾	1	1⅝	3	1¼	1	5⅝	4	1⅞	1	9⅝	5	2⅜
0	9¾	2	1⅛	1	1¾	3	1⅝	1	5¾	4	2¼	1	9¾	5	2¾
0	9⅞	2	1½	1	1⅞	3	2	1	5⅞	4	2⅝	1	9⅞	5	3⅛
0	10	2	1⅞	1	2	3	2½	1	6	4	3	1	10	5	3⅝
0	10⅛	2	2⅜	1	2⅛	3	2⅞	1	6⅛	4	3⅜	1	10⅛	5	4
0	10¼	2	2¾	1	2¼	3	3¼	1	6¼	4	3¾	1	10¼	5	4⅜
0	10⅜	2	3⅛	1	2⅜	3	3⅝	1	6⅜	4	4⅛	1	10⅜	5	4¾
0	10½	2	3½	1	2½	3	4	1	6½	4	4½	1	10½	5	5⅛
0	10⅝	2	3⅞	1	2⅝	3	4⅜	1	6⅝	4	5	1	10⅝	5	5½
0	10¾	2	4¼	1	2¾	3	4⅞	1	6¾	4	5⅜	1	10¾	5	5⅞
0	10⅞	2	4⅝	1	2⅞	3	5¼	1	6⅞	4	5¾	1	10⅞	5	6⅜
0	11	2	5	1	3	3	5⅝	1	7	4	6⅛	1	11	5	6¾
0	11⅛	2	5½	1	3⅛	3	6	1	7⅛	4	6½	1	11⅛	5	7⅛
0	11¼	2	5⅞	1	3¼	3	6⅜	1	7¼	4	7	1	11¼	5	7½
0	11⅜	2	6¼	1	3⅜	3	6¾	1	7⅜	4	7⅜	1	11⅜	5	8
0	11½	2	6⅝	1	3½	3	7⅛	1	7½	4	7¾	1	11½	5	8⅜
0	11⅝	2	7	1	3⅝	3	7⅝	1	7⅝	4	8⅛	1	11⅝	5	8¾
0	11¾	2	7⅜	1	3¾	3	8	1	7¾	4	8½	1	11¾	5	9⅛
0	11⅞	2	7¾	1	3⅞	3	8⅜	1	7⅞	4	8⅞	1	11⅞	5	9½
1	0	2	8¼	1	4	3	8¾	1	8	4	9¼	2	0	5	9⅞
1	0⅛	2	8⅝	1	4⅛	3	9⅛	1	8⅛	4	9⅝	2	0⅛	5	10¼
1	0¼	2	9	1	4¼	3	9½	1	8¼	4	10⅛	2	0¼	5	10⅝
1	0⅜	2	9⅜	1	4⅜	3	9⅞	1	8⅜	4	10½	2	0⅜	5	11
1	0½	2	9¾	1	4½	3	10⅜	1	8½	4	10⅞	2	0½	5	11½
1	0⅝	2	10⅛	1	4⅝	3	10¾	1	8⅝	4	11	2	0⅝	5	11⅞
1	0¾	2	10½	1	4¾	3	11⅛	1	8¾	4	11⅝	2	0¾	6	0¼
1	0⅞	2	10⅞	1	4⅞	3	11½	1	8⅞	5	0	2	0⅞	6	0⅝

For Angle Iron measuring $\frac{1}{8}$ of an Inch thick, diagonally across the root.

FLANGE INSIDE.

OUTSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.		OUTSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.		OUTSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.		OUTSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.	
FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.
2	1	6	1	2	5	7	$1\frac{1}{2}$	2	9	8	$2\frac{1}{8}$	3	1	9	$2\frac{3}{4}$
2	$1\frac{1}{8}$	6	$1\frac{3}{8}$	2	$5\frac{1}{8}$	7	2	2	$9\frac{1}{8}$	8	$2\frac{1}{2}$	3	$1\frac{1}{8}$	9	$3\frac{1}{8}$
2	$1\frac{1}{4}$	6	$1\frac{3}{4}$	2	$5\frac{1}{4}$	7	$2\frac{3}{8}$	2	$9\frac{1}{4}$	8	$2\frac{7}{8}$	3	$1\frac{1}{4}$	9	$3\frac{1}{2}$
2	$1\frac{3}{8}$	6	$2\frac{1}{4}$	2	$5\frac{3}{8}$	7	$2\frac{3}{4}$	2	$9\frac{3}{8}$	8	$3\frac{3}{8}$	3	$1\frac{3}{8}$	9	$3\frac{7}{8}$
2	$1\frac{1}{2}$	6	$2\frac{5}{8}$	2	$5\frac{1}{2}$	7	$3\frac{1}{8}$	2	$9\frac{1}{2}$	8	$3\frac{3}{4}$	3	$1\frac{1}{2}$	9	$4\frac{1}{4}$
2	$1\frac{5}{8}$	6	3	2	$5\frac{5}{8}$	7	$3\frac{1}{2}$	2	$9\frac{5}{8}$	8	$4\frac{1}{8}$	3	$1\frac{5}{8}$	9	$4\frac{5}{8}$
2	$1\frac{3}{4}$	6	$3\frac{3}{8}$	2	$5\frac{3}{4}$	7	$3\frac{7}{8}$	2	$9\frac{3}{4}$	8	$4\frac{1}{2}$	3	$1\frac{3}{4}$	9	5
2	$1\frac{7}{8}$	6	$3\frac{3}{4}$	2	$5\frac{7}{8}$	7	$4\frac{3}{8}$	2	$9\frac{7}{8}$	8	$4\frac{7}{8}$	3	$1\frac{7}{8}$	9	$5\frac{1}{2}$
2	2	6	$4\frac{1}{8}$	2	6	7	$4\frac{3}{4}$	2	10	8	$5\frac{1}{4}$	3	2	9	$5\frac{7}{8}$
2	$2\frac{1}{8}$	6	$4\frac{1}{2}$	2	$6\frac{1}{8}$	7	$5\frac{1}{8}$	2	$10\frac{1}{8}$	8	$5\frac{5}{8}$	3	$2\frac{1}{8}$	9	$6\frac{1}{4}$
2	$2\frac{1}{4}$	6	$4\frac{7}{8}$	2	$6\frac{1}{4}$	7	$5\frac{1}{2}$	2	$10\frac{1}{4}$	8	6	3	$2\frac{1}{4}$	9	$6\frac{5}{8}$
2	$2\frac{3}{8}$	6	$5\frac{3}{8}$	2	$6\frac{3}{8}$	7	$5\frac{7}{8}$	2	$10\frac{3}{8}$	8	$6\frac{1}{2}$	3	$2\frac{3}{8}$	9	7
2	$2\frac{1}{2}$	6	$5\frac{3}{4}$	2	$6\frac{1}{2}$	7	$6\frac{1}{4}$	2	$10\frac{1}{2}$	8	$6\frac{7}{8}$	3	$2\frac{1}{2}$	9	$7\frac{3}{8}$
2	$2\frac{5}{8}$	6	$6\frac{1}{8}$	2	$6\frac{5}{8}$	7	$6\frac{5}{8}$	2	$10\frac{5}{8}$	8	$7\frac{1}{4}$	3	$2\frac{5}{8}$	9	$7\frac{7}{8}$
2	$2\frac{3}{4}$	6	$6\frac{1}{2}$	2	$6\frac{3}{4}$	7	7	2	$10\frac{3}{4}$	8	$7\frac{5}{8}$	3	$2\frac{3}{4}$	9	$8\frac{1}{4}$
2	$2\frac{7}{8}$	6	$6\frac{7}{8}$	2	$6\frac{7}{8}$	7	$7\frac{1}{2}$	2	$10\frac{7}{8}$	8	8	3	$2\frac{7}{8}$	9	$8\frac{5}{8}$
2	3	6	$7\frac{1}{4}$	2	7	7	$7\frac{7}{8}$	2	11	8	$8\frac{3}{8}$	3	3	9	9
2	$3\frac{1}{8}$	6	$7\frac{5}{8}$	2	$7\frac{1}{8}$	7	$8\frac{1}{4}$	2	$11\frac{1}{8}$	8	$8\frac{7}{8}$	3	$3\frac{1}{8}$	9	$9\frac{3}{8}$
2	$3\frac{1}{4}$	6	$8\frac{1}{8}$	2	$7\frac{1}{4}$	7	$8\frac{5}{8}$	2	$11\frac{1}{4}$	8	$9\frac{1}{4}$	3	$3\frac{1}{4}$	9	$9\frac{3}{4}$
2	$3\frac{3}{8}$	6	$8\frac{1}{2}$	2	$7\frac{3}{8}$	7	9	2	$11\frac{3}{8}$	8	$9\frac{5}{8}$	3	$3\frac{3}{8}$	9	$10\frac{1}{8}$
2	$3\frac{1}{2}$	6	$8\frac{7}{8}$	2	$7\frac{1}{2}$	7	$9\frac{3}{8}$	2	$11\frac{1}{2}$	8	10	3	$3\frac{1}{2}$	9	$10\frac{1}{2}$
2	$3\frac{5}{8}$	6	$9\frac{1}{4}$	2	$7\frac{5}{8}$	7	$9\frac{3}{4}$	2	$11\frac{5}{8}$	8	$10\frac{3}{8}$	3	$3\frac{5}{8}$	9	$10\frac{7}{8}$
2	$3\frac{3}{4}$	6	$9\frac{5}{8}$	2	$7\frac{3}{4}$	7	$10\frac{1}{4}$	2	$11\frac{3}{4}$	8	$10\frac{3}{4}$	3	$3\frac{3}{4}$	9	$11\frac{3}{8}$
2	$3\frac{7}{8}$	6	10	2	$7\frac{7}{8}$	7	$10\frac{5}{8}$	2	$11\frac{7}{8}$	8	$11\frac{1}{8}$	3	$3\frac{7}{8}$	9	$11\frac{3}{4}$
2	4	6	$10\frac{1}{2}$	2	8	7	11	3	0	8	$11\frac{1}{2}$	3	4	10	$0\frac{1}{8}$
2	$4\frac{1}{8}$	6	$10\frac{7}{8}$	2	$8\frac{1}{8}$	7	$11\frac{3}{8}$	3	$0\frac{1}{8}$	9	0	3	$4\frac{1}{8}$	10	$0\frac{1}{2}$
2	$4\frac{1}{4}$	6	$11\frac{1}{4}$	2	$8\frac{1}{4}$	7	$11\frac{3}{4}$	3	$0\frac{1}{4}$	9	$0\frac{3}{8}$	3	$4\frac{1}{4}$	10	$0\frac{7}{8}$
2	$4\frac{3}{8}$	6	$11\frac{5}{8}$	2	$8\frac{3}{8}$	8	$0\frac{1}{4}$	3	$0\frac{3}{8}$	9	$0\frac{3}{4}$	3	$4\frac{3}{8}$	10	$1\frac{3}{8}$
2	$4\frac{1}{2}$	7	0	2	$8\frac{1}{2}$	8	$0\frac{1}{2}$	3	$0\frac{1}{2}$	9	$1\frac{1}{8}$	3	$4\frac{1}{2}$	10	$1\frac{3}{4}$
2	$4\frac{5}{8}$	7	$0\frac{3}{8}$	2	$8\frac{5}{8}$	8	1	3	$0\frac{5}{8}$	9	$1\frac{1}{2}$	3	$4\frac{5}{8}$	10	$2\frac{1}{8}$
2	$4\frac{3}{4}$	7	$0\frac{3}{2}$	2	$8\frac{3}{4}$	8	$1\frac{3}{8}$	3	$0\frac{3}{4}$	9	$1\frac{7}{8}$	3	$4\frac{3}{4}$	10	$2\frac{1}{2}$
2	$4\frac{7}{8}$	7	$1\frac{1}{8}$	2	$8\frac{7}{8}$	8	$1\frac{3}{4}$	3	$0\frac{7}{8}$	9	$2\frac{3}{8}$	3	$4\frac{7}{8}$	10	$2\frac{7}{8}$

For Angle Iron measuring $\frac{3}{8}$ of an Inch thick, diagonally across the Foot.

FLANGE INSIDE.

OUTSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.		OUTSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.		OUTSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.		OUTSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.	
FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.
3	5	10	3 1/8	3	9	11	3 7/8	4	1	12	4 3/8	4	5	13	5
3	5 1/8	10	3 5/8	3	9 1/8	11	4 1/4	4	1 1/8	12	4 3/4	4	5 1/8	13	5 3/8
3	5 1/4	10	4	3	9 1/4	11	4 3/8	4	1 1/4	12	5 1/4	4	5 1/4	13	5 3/4
3	5 3/8	10	4 1/2	3	9 3/8	11	5	4	1 3/8	12	5 5/8	4	5 3/8	13	6 1/8
3	5 1/2	10	4 7/8	3	9 1/2	11	5 3/8	4	1 1/2	12	6	4	5 1/2	13	6 1/2
3	5 5/8	10	5 1/4	3	9 5/8	11	5 3/4	4	1 5/8	12	6 3/8	4	5 5/8	13	7
3	5 3/4	10	5 5/8	3	9 3/4	11	6 1/4	4	1 3/4	12	6 3/4	4	5 3/4	13	7 3/8
3	5 7/8	10	6	3	9 7/8	11	6 5/8	4	1 7/8	12	7 1/8	4	5 7/8	13	7 3/4
3	6	10	6 3/8	3	10	11	7	4	2	12	7 1/2	4	6	13	8 1/8
3	6 1/8	10	6 7/8	3	10 1/8	11	7 3/8	4	2 1/8	12	7 7/8	4	6 1/8	13	8 1/2
3	6 1/4	10	7 1/4	3	10 1/4	11	7 3/4	4	2 1/4	12	8 3/8	4	6 1/4	13	8 7/8
3	6 3/8	10	7 5/8	3	10 3/8	11	8 1/8	4	2 3/8	12	8 3/4	4	6 3/8	13	9 1/4
3	6 1/2	10	8	3	10 1/2	11	8 1/2	4	2 1/2	12	9 1/8	4	6 1/2	13	9 5/8
3	6 5/8	10	8 3/8	3	10 5/8	11	8 7/8	4	2 5/8	12	9 1/2	4	6 5/8	13	10 1/8
3	6 3/4	10	8 3/4	3	10 3/4	11	9 3/8	4	2 3/4	12	9 7/8	4	6 3/4	13	10 1/2
3	6 7/8	10	9 1/8	3	10 7/8	11	9 3/4	4	2 7/8	12	10 3/8	4	6 7/8	13	10 7/8
3	7	10	9 1/2	3	11	11	10 1/8	4	3	12	10 3/4	4	7	13	11 1/4
3	7 1/8	10	9 7/8	3	11 1/8	11	10 1/2	4	3 1/8	12	11 1/8	4	7 1/8	13	11 5/8
3	7 1/4	10	10 3/8	3	11 1/4	11	10 7/8	4	3 1/4	12	11 1/2	4	7 1/4	14	0
3	7 3/8	10	10 3/4	3	11 3/8	11	11 1/4	4	3 3/8	12	11 7/8	4	7 3/8	14	0 3/8
3	7 1/2	10	11 1/8	3	11 1/2	11	11 5/8	4	3 1/2	13	0 1/4	4	7 1/2	14	0 7/8
3	7 5/8	10	11 1/2	3	11 5/8	12	0 1/8	4	3 5/8	13	0 5/8	4	7 5/8	14	1 1/4
3	7 3/4	10	11 7/8	3	11 3/4	12	0 1/2	4	3 3/4	13	1	4	7 3/4	14	1 5/8
3	7 7/8	11	0 3/8	3	11 7/8	12	0 7/8	4	3 7/8	13	1 1/2	4	7 7/8	14	2
3	8	11	0 3/4	4	0	12	1 1/4	4	4	13	1 7/8	4	8	14	2 3/8
3	8 1/8	11	1 1/8	4	0 1/8	12	1 5/8	4	4 1/8	13	2 1/4	4	8 1/8	14	2 3/4
3	8 1/4	11	1 1/2	4	0 1/4	12	2	4	4 1/4	13	2 5/8	4	8 1/4	14	3 1/8
3	8 3/8	11	1 7/8	4	0 3/8	12	2 3/8	4	4 3/8	13	3	4	8 3/8	14	3 1/2
3	8 1/2	11	2 1/4	4	0 1/2	12	2 7/8	4	4 1/2	13	3 3/8	4	8 1/2	14	4
3	8 5/8	11	2 5/8	4	0 5/8	12	3 1/4	4	4 5/8	13	3 3/4	4	8 5/8	14	4 3/8
3	8 3/4	11	3	4	0 3/4	12	3 5/8	4	4 3/4	13	4 1/4	4	8 3/4	14	4 3/4
3	8 7/8	11	3 1/2	4	0 7/8	12	4	4	4 7/8	13	4 5/8	4	8 7/8	14	5 1/8

For Angle Iron measuring $\frac{7}{8}$ of an Inch thick, diagonally across the root.

FLANGE INSIDE.

OUTSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.		OUTSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.		OUTSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.		OUTSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.	
FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN	FT.	IN.	FT.	IN.	FT.	IN.
4	9	14	5½	5	1	15	6⅛	5	5	16	6⅝	5	9	17	7¼
4	9⅛	14	5⅞	5	1⅛	15	6⅛	5	5⅛	16	7	5	9⅛	17	7⅝
4	9¼	14	6⅜	5	1¼	15	6⅞	5	5¼	16	7½	5	9¼	17	8
4	9⅜	14	6¾	5	1⅜	15	7¼	5	5⅜	16	7⅞	5	9⅜	17	8⅜
4	9½	14	7⅛	5	1½	15	7¾	5	5½	16	8¼	5	9½	17	8⅞
4	9⅝	14	7½	5	1⅝	15	8⅛	5	5⅝	16	8⅝	5	9⅝	17	9¼
4	9¾	14	7⅞	5	1¾	15	8½	5	5¾	16	9	5	9¾	17	9⅝
4	9⅞	14	8¼	5	1⅞	15	8⅞	5	5⅞	16	9⅜	5	9⅞	17	10
4	10	14	8¾	5	2	15	9¼	5	6	16	9⅞	5	10	17	10⅜
4	10⅛	14	9⅛	5	2⅛	15	9⅝	5	6⅛	16	10¼	5	10⅛	17	10¾
4	10¼	14	9½	5	2¼	15	10	5	6¼	16	10⅝	5	10¼	17	11⅛
4	10⅜	14	9⅞	5	2⅜	15	10⅜	5	6⅜	16	11	5	10⅜	17	11½
4	10½	14	10¼	5	2½	15	10⅞	5	6½	16	11⅜	5	10½	18	0
4	10⅝	14	10⅝	5	2⅝	15	11¼	5	6⅝	16	11¾	5	10⅝	18	0⅜
4	10¾	14	11	5	2¾	15	11⅝	5	6¾	17	0⅛	5	10¾	18	0¾
4	10⅞	14	11½	5	2⅞	16	0	5	6⅞	17	0⅝	5	10⅞	18	1⅛
4	11	14	11⅞	5	3	16	0⅜	5	7	17	1	5	11	18	1½
4	11⅛	15	0¼	5	3⅛	16	0¾	5	7⅛	17	1⅜	5	11⅛	18	1⅞
4	11¼	15	0⅝	5	3¼	16	1⅛	5	7¼	17	1¾	5	11¼	18	2⅜
4	11⅜	15	1	5	3⅜	16	1⅝	5	7⅜	17	2⅛	5	11⅜	18	2¾
4	11½	15	1⅜	5	3½	16	2	5	7½	17	2½	5	11½	18	3⅛
4	11⅝	15	1⅞	5	3⅝	16	2⅜	5	7⅝	17	2⅞	5	11⅝	18	3½
4	11¾	15	2¼	5	3¾	16	2¾	5	7¾	17	3⅜	5	11¾	18	3⅞
4	11⅞	15	2⅝	5	3⅞	16	3⅛	5	7⅞	17	3¾	5	11⅞	18	4¼
5	0	15	3	5	4	16	3½	5	8	17	4⅛	6	0	18	4⅝
5	0⅛	15	3⅜	5	4⅛	16	3⅞	5	8⅛	17	4½	6	0⅛	18	5
5	0¼	15	3¾	5	4¼	16	4⅜	5	8¼	17	4⅞	6	0¼	18	5½
5	0⅜	15	4⅛	5	4⅜	16	4¾	5	8⅜	17	5¼	6	0⅜	18	5⅞
5	0½	15	4½	5	4½	16	5⅛	5	8½	17	5⅝	6	0½	18	6¼
5	0⅝	15	4⅞	5	4⅝	16	5½	5	8⅝	17	6	6	0⅝	18	6⅝
5	0¾	15	5⅜	5	4¾	16	5⅞	5	8¾	17	6½	6	0¾	18	7
5	0⅞	15	5¾	5	4⅞	16	6¼	5	8⅞	17	6⅞	6	0⅞	18	7⅜

For Angle Iron measuring $\frac{1}{8}$ of an Inch thick, diagonally across the root.

FLANGE INSIDE.

OUTSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.		OUTSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.		OUTSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.		OUTSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.	
FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN	FT.	IN.	FT.	IN.	FT.	IN.
6	1	18	7 7/8	6	5	19	8 3/8	6	9	20	9	7	1	21	9 1/2
6	1 1/8	18	8 1/4	6	5 1/8	19	8 3/4	6	9 1/8	20	9 3/8	7	1 1/8	21	9 7/8
6	1 1/4	18	8 5/8	6	5 1/4	19	9 1/8	6	9 1/4	20	9 3/4	7	1 1/4	21	10 3/8
6	1 3/8	18	9	6	5 3/8	19	9 5/8	6	9 3/8	20	10 1/8	7	1 3/8	21	10 3/4
6	1 1/2	18	9 3/8	6	5 1/2	19	10	6	9 1/2	20	10 1/2	7	1 1/2	21	11 1/8
6	1 5/8	18	9 3/4	6	5 5/8	19	10 3/8	6	9 5/8	20	10 7/8	7	1 5/8	21	11 1/2
6	1 3/4	18	10 1/8	6	5 3/4	19	10 3/4	6	9 3/4	20	11 3/8	7	1 3/4	21	11 7/8
6	1 7/8	18	10 1/2	6	5 7/8	19	11 1/8	6	9 7/8	20	11 3/4	7	1 7/8	22	0 1/4
6	2	18	11	6	6	19	11 1/2	6	10	21	0 1/8	7	2	22	0 5/8
6	2 1/8	18	11 3/8	6	6 1/8	19	11 7/8	6	10 1/8	21	0 1/2	7	2 1/8	22	1
6	2 1/4	18	11 3/4	6	6 1/4	20	0 3/8	6	10 1/4	21	0 7/8	7	2 1/4	22	1 1/2
6	2 3/8	19	0 1/8	6	6 3/8	20	0 3/4	6	10 3/8	21	1 1/4	7	2 3/8	22	1 7/8
6	2 1/2	19	0 1/2	6	6 1/2	20	1 1/8	6	10 1/2	21	1 5/8	7	2 1/2	22	2 1/4
6	2 5/8	19	0 7/8	6	6 5/8	20	1 1/2	6	10 5/8	21	2	7	2 5/8	22	2 5/8
6	2 3/4	19	1 3/8	6	6 3/4	20	1 7/8	6	10 3/4	21	2 1/2	7	2 3/4	22	3
6	2 7/8	19	1 3/4	6	6 7/8	20	2 1/4	6	10 7/8	21	2 7/8	7	2 7/8	22	3 3/8
6	3	19	2 1/8	6	7	20	2 5/8	6	11	21	3 1/4	7	3	22	3 7/8
6	3 1/8	19	2 1/2	6	7 1/8	20	3	6	11 1/8	21	3 5/8	7	3 1/8	22	4 1/4
6	3 1/4	19	2 7/8	6	7 1/4	20	3 1/2	6	11 1/4	21	4	7	3 1/4	22	4 5/8
6	3 3/8	19	3 1/4	6	7 3/8	20	3 7/8	6	11 3/8	21	4 3/8	7	3 3/8	22	5
6	3 1/2	19	3 5/8	6	7 1/2	20	4 1/4	6	11 1/2	21	4 3/4	7	3 1/2	22	5 3/8
6	3 5/8	19	4	6	7 5/8	20	4 5/8	6	11 5/8	21	5 1/8	7	3 5/8	22	5 3/4
6	3 3/4	19	4 1/2	6	7 3/4	20	5	6	11 3/4	21	5 1/2	7	3 3/4	22	6 1/8
6	3 7/8	19	4 7/8	6	7 7/8	20	5 3/8	6	11 7/8	21	6	7	3 7/8	22	6 1/2
6	4	19	5 1/4	6	8	20	5 7/8	7	0	21	6 3/8	7	4	22	7
6	4 1/8	19	5 5/8	6	8 1/8	20	6 1/8	7	0 1/8	21	6 3/4	7	4 1/8	22	7 3/8
6	4 1/4	19	6	6	8 1/4	20	6 5/8	7	0 1/4	21	7 1/8	7	4 1/4	22	7 3/4
6	4 3/8	19	6 3/8	6	8 3/8	20	7	7	0 3/8	21	7 5/8	7	4 3/8	22	8 1/8
6	4 1/2	19	6 7/8	6	8 1/2	20	7 3/8	7	0 1/2	21	8	7	4 1/2	22	8 1/2
6	4 5/8	19	7 1/4	6	8 5/8	20	7 3/4	7	0 5/8	21	8 3/8	7	4 5/8	22	8 7/8
6	4 3/4	19	7 5/8	6	8 3/4	20	8 1/8	7	0 3/4	21	8 3/4	7	4 3/4	22	9 1/4
6	4 7/8	19	8	6	8 7/8	20	8 1/2	7	0 7/8	21	9 1/2	7	4 7/8	22	9 3/4

For ANGLE IRON measuring $\frac{7}{8}$ of an Inch thick, diagonally across the root.

FLANGE INSIDE.

OUTSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.		OUTSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.		OUTSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.		OUTSIDE DIAMETER OF ING.		LENGTH REQUIRED FOR RING.	
FT.	N.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.
7	5	22	$10\frac{1}{8}$	7	9	23	$10\frac{5}{8}$	8	1	24	$11\frac{1}{4}$	8	5	25	$11\frac{3}{4}$
7	$5\frac{1}{8}$	22	$10\frac{1}{2}$	7	$9\frac{1}{8}$	23	11	8	$1\frac{1}{8}$	24	$11\frac{5}{8}$	8	$5\frac{1}{8}$	26	$0\frac{1}{8}$
7	$5\frac{1}{4}$	22	$10\frac{7}{8}$	7	$9\frac{1}{4}$	23	$11\frac{1}{2}$	8	$1\frac{1}{4}$	25	0	8	$5\frac{1}{4}$	26	$0\frac{5}{8}$
7	$5\frac{3}{8}$	22	$11\frac{1}{4}$	7	$9\frac{3}{8}$	23	$11\frac{7}{8}$	8	$1\frac{3}{8}$	25	$0\frac{3}{8}$	8	$5\frac{3}{8}$	26	1
7	$5\frac{1}{2}$	22	$11\frac{5}{8}$	7	$9\frac{1}{2}$	24	$0\frac{1}{4}$	8	$1\frac{1}{2}$	25	$0\frac{3}{4}$	8	$5\frac{1}{2}$	26	$1\frac{3}{8}$
7	$5\frac{5}{8}$	23	0	7	$9\frac{5}{8}$	24	$0\frac{5}{8}$	8	$1\frac{5}{8}$	25	$1\frac{1}{4}$	8	$5\frac{5}{8}$	26	$1\frac{3}{4}$
7	$5\frac{3}{4}$	23	$0\frac{1}{2}$	7	$9\frac{3}{4}$	24	1	8	$1\frac{3}{4}$	25	$1\frac{5}{8}$	8	$5\frac{3}{4}$	26	$2\frac{1}{8}$
7	$5\frac{7}{8}$	23	$0\frac{7}{8}$	7	$9\frac{7}{8}$	24	$1\frac{3}{8}$	8	$1\frac{7}{8}$	25	2	8	$5\frac{7}{8}$	26	$2\frac{1}{2}$
7	6	23	$1\frac{1}{4}$	7	10	24	$1\frac{3}{4}$	8	2	25	$2\frac{3}{8}$	8	6	26	$2\frac{7}{8}$
7	$6\frac{1}{8}$	23	$1\frac{5}{8}$	7	$10\frac{1}{8}$	24	$2\frac{1}{4}$	8	$2\frac{1}{8}$	25	$2\frac{3}{4}$	8	$6\frac{1}{8}$	26	$3\frac{3}{8}$
7	$6\frac{1}{4}$	23	2	7	$10\frac{1}{4}$	24	$2\frac{5}{8}$	8	$2\frac{1}{4}$	25	$3\frac{1}{8}$	8	$6\frac{1}{4}$	26	$3\frac{3}{4}$
7	$6\frac{3}{8}$	23	$2\frac{3}{8}$	7	$10\frac{3}{8}$	24	3	8	$2\frac{3}{8}$	25	$3\frac{1}{2}$	8	$6\frac{3}{8}$	26	$4\frac{1}{8}$
7	$6\frac{1}{2}$	23	$2\frac{3}{4}$	7	$10\frac{1}{2}$	24	$3\frac{3}{8}$	8	$2\frac{1}{2}$	25	$3\frac{7}{8}$	8	$6\frac{1}{2}$	26	$4\frac{1}{2}$
7	$6\frac{5}{8}$	23	$3\frac{1}{4}$	7	$10\frac{5}{8}$	24	$3\frac{3}{4}$	8	$2\frac{5}{8}$	25	$4\frac{3}{8}$	8	$6\frac{5}{8}$	26	$4\frac{7}{8}$
7	$6\frac{3}{4}$	23	$3\frac{5}{8}$	7	$10\frac{3}{4}$	24	$4\frac{1}{8}$	8	$2\frac{3}{4}$	25	$4\frac{3}{4}$	8	$6\frac{3}{4}$	26	$5\frac{1}{4}$
7	$6\frac{7}{8}$	23	4	7	$10\frac{7}{8}$	24	$4\frac{1}{2}$	8	$2\frac{7}{8}$	25	$5\frac{1}{8}$	8	$6\frac{7}{8}$	26	$5\frac{5}{8}$
7	7	23	$4\frac{3}{8}$	7	11	24	$4\frac{7}{8}$	8	3	25	$5\frac{1}{2}$	8	7	26	6
7	$7\frac{1}{8}$	23	$4\frac{3}{4}$	7	$11\frac{1}{8}$	24	$5\frac{3}{8}$	8	$3\frac{1}{8}$	25	$5\frac{7}{8}$	8	$7\frac{1}{8}$	26	$6\frac{1}{2}$
7	$7\frac{1}{4}$	23	$5\frac{1}{8}$	7	$11\frac{1}{4}$	24	$5\frac{3}{4}$	8	$3\frac{1}{4}$	25	$6\frac{1}{4}$	8	$7\frac{1}{4}$	26	$6\frac{7}{8}$
7	$7\frac{3}{8}$	23	$5\frac{1}{2}$	7	$11\frac{3}{8}$	24	$6\frac{1}{8}$	8	$3\frac{3}{8}$	25	$6\frac{5}{8}$	8	$7\frac{3}{8}$	26	$7\frac{1}{4}$
7	$7\frac{1}{2}$	23	6	7	$11\frac{1}{2}$	24	$6\frac{1}{2}$	8	$3\frac{1}{2}$	25	7	8	$7\frac{1}{2}$	26	$7\frac{5}{8}$
7	$7\frac{5}{8}$	23	$6\frac{3}{8}$	7	$11\frac{5}{8}$	24	$6\frac{7}{8}$	8	$3\frac{5}{8}$	25	$7\frac{1}{2}$	8	$7\frac{5}{8}$	26	8
7	$7\frac{3}{4}$	23	$6\frac{3}{4}$	7	$11\frac{3}{4}$	24	$7\frac{1}{4}$	8	$3\frac{3}{4}$	25	$7\frac{7}{8}$	8	$7\frac{3}{4}$	26	$8\frac{3}{8}$
7	$7\frac{7}{8}$	23	$7\frac{1}{8}$	7	$11\frac{7}{8}$	24	$7\frac{5}{8}$	8	$3\frac{7}{8}$	25	$8\frac{1}{4}$	8	$7\frac{7}{8}$	26	$8\frac{7}{8}$
7	8	23	$7\frac{1}{2}$	8	0	24	8	8	4	25	$8\frac{5}{8}$	8	8	26	$9\frac{1}{4}$
7	$8\frac{1}{8}$	23	$7\frac{7}{8}$	8	$0\frac{1}{8}$	24	$8\frac{1}{2}$	8	$4\frac{1}{8}$	25	9	8	$8\frac{1}{8}$	26	$9\frac{5}{8}$
7	$8\frac{1}{4}$	23	$8\frac{1}{4}$	8	$0\frac{1}{4}$	24	$8\frac{7}{8}$	8	$4\frac{1}{4}$	25	$9\frac{1}{2}$	8	$8\frac{1}{4}$	26	10
7	$8\frac{3}{8}$	23	$8\frac{3}{4}$	8	$0\frac{3}{8}$	24	$9\frac{1}{4}$	8	$4\frac{3}{8}$	25	$9\frac{7}{8}$	8	$8\frac{3}{8}$	26	$10\frac{3}{8}$
7	$8\frac{1}{2}$	23	$9\frac{1}{8}$	8	$0\frac{1}{2}$	24	$9\frac{5}{8}$	8	$4\frac{1}{2}$	25	$10\frac{1}{4}$	8	$8\frac{1}{2}$	26	$10\frac{3}{4}$
7	$8\frac{5}{8}$	23	$9\frac{1}{2}$	8	$0\frac{5}{8}$	24	10	8	$4\frac{5}{8}$	25	$10\frac{5}{8}$	8	$8\frac{5}{8}$	26	$11\frac{1}{8}$
7	$8\frac{3}{4}$	23	$9\frac{7}{8}$	8	$0\frac{3}{4}$	24	$10\frac{1}{2}$	8	$4\frac{3}{4}$	25	11	8	$8\frac{3}{4}$	26	$11\frac{1}{2}$
7	$8\frac{7}{8}$	23	$10\frac{1}{4}$	8	$0\frac{7}{8}$	24	$10\frac{7}{8}$	8	$4\frac{7}{8}$	25	$11\frac{3}{8}$	8	$8\frac{7}{8}$	27	0

TABLE XVI.

For Angle Iron measuring 1 Inch thick, diagonally across the root.

FLANGE INSIDE.

OUTSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.		OUTSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.		OUTSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.		OUTSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.	
FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.
0	9	1	10	1	1	2	10½	1	5	3	11⅛	1	9	4	11⅝
0	9⅛	1	10⅜	1	1⅛	2	10⅞	1	5⅛	3	11½	1	9⅛	5	0
0	9¼	1	10¾	1	1¼	2	11⅜	1	5¼	3	11⅞	1	9¼	5	0⅜
0	9⅜	1	11⅛	1	1⅜	2	11¾	1	5⅜	4	0¼	1	9⅜	5	0⅞
0	9½	1	11¼	1	1½	3	0⅛	1	5½	4	0⅝	1	9½	5	1¼
0	9⅝	1	11⅞	1	1⅝	3	0½	1	5⅝	4	1	1	9⅝	5	1⅝
0	9¾	2	0⅜	1	1¾	3	0⅞	1	5¾	4	1⅜	1	9¾	5	2
0	9⅞	2	0¾	1	1⅞	3	1¼	1	5⅞	4	1⅞	1	9⅞	5	2⅜
0	10	2	1⅛	1	2	3	1⅝	1	6	4	2¼	1	10	5	2¾
0	10⅛	2	1½	1	2⅛	3	2	1	6⅛	4	2⅝	1	10⅛	5	3⅛
0	10¼	2	1⅞	1	2¼	3	2½	1	6¼	4	3	1	10¼	5	3⅝
0	10⅜	2	2⅜	1	2⅜	3	2⅞	1	6⅜	4	3⅜	1	10⅜	5	4
0	10½	2	2¾	1	2½	3	3¼	1	6½	4	3¾	1	10½	5	4⅜
0	10⅝	2	3⅛	1	2⅝	3	3⅝	1	6⅝	4	4⅛	1	10⅝	5	4¾
0	10¾	2	3½	1	2¾	3	4	1	6¾	4	4½	1	10¾	5	5⅛
0	10⅞	2	3⅞	1	2⅞	3	4⅜	1	6⅞	4	5	1	10⅞	5	5½
0	11	2	4¼	1	3	3	4⅞	1	7	4	5⅜	1	11	5	5⅞
0	11⅛	2	4⅝	1	3⅛	3	5¼	1	7⅛	4	5¾	1	11⅛	5	6⅜
0	11¼	2	5	1	3¼	3	5⅝	1	7¼	4	6⅛	1	11¼	5	6¾
0	11⅜	2	5½	1	3⅜	3	6	1	7⅜	4	6½	1	11⅜	5	7⅛
0	11½	2	5⅞	1	3½	3	6⅜	1	7½	4	7	1	11½	5	7⅝
0	11⅝	2	6¼	1	3⅝	3	6¾	1	7⅝	4	7⅜	1	11⅝	5	8
0	11¾	2	6⅝	1	3¾	3	7⅛	1	7¾	4	7¾	1	11¾	5	8⅜
0	11⅞	2	7	1	3⅞	3	7⅝	1	7⅞	4	8⅛	1	11⅞	5	8¾
1	0	2	7⅜	1	4	3	8	1	8	4	8½	2	0	5	9⅛
1	0⅛	2	7¾	1	4⅛	3	8⅜	1	8⅛	4	8⅞	2	0⅛	5	9½
1	0¼	2	8¼	1	4¼	3	8¾	1	8¼	4	9¼	2	0¼	5	9⅞
1	0⅜	2	8⅝	1	4⅜	3	9⅛	1	8⅜	4	9⅝	2	0⅜	5	10¼
1	0½	2	9	1	4½	3	9½	1	8½	4	10⅛	2	0½	5	10⅝
1	0⅝	2	9⅜	1	4⅝	3	9⅞	1	8⅝	4	10½	2	0⅝	5	11
1	0¾	2	9¾	1	4¾	3	10⅜	1	8¾	4	10⅞	2	0¾	5	11½
1	0⅞	2	10⅛	1	4⅞	3	10¾	1	8⅞	4	11	2	0⅞	5	11⅞

For Angle Iron measuring 1 Inch thick, diagonally across the root.

FLANGE INSIDE.

OUTSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.		OUTSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.		OUTSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.		OUTSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.	
FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN	FT.	IN.	FT.	IN.	FT.	IN.
2	1	6	0¼	2	5	7	0¾	2	9	8	1⅜	3	1	9	1⅞
2	1⅛	6	0⅝	2	5⅛	7	1⅛	2	9⅛	8	1¾	3	1⅛	9	2⅜
2	1¼	6	1	2	5¼	7	1½	2	9¼	8	2⅛	3	1¼	9	2¾
2	1⅜	6	1⅜	2	5⅜	7	2	2	9⅜	8	2½	3	1⅜	9	3⅛
2	1½	6	1¾	2	5½	7	2⅜	2	9½	8	2⅞	3	1½	9	3½
2	1⅝	6	2¼	2	5⅝	7	2¾	2	9⅝	8	3⅜	3	1⅝	9	3⅞
2	1¾	6	2⅝	2	5¾	7	3⅛	2	9¾	8	3¾	3	1¾	9	4¼
2	1⅞	6	3	2	5⅞	7	3½	2	9⅞	8	4⅛	3	1⅞	9	4⅝
2	2	6	3⅜	2	6	7	3⅞	2	10	8	4½	3	2	9	5
2	2⅛	6	3¾	2	6⅛	7	4⅜	2	10⅛	8	4⅞	3	2⅛	9	5½
2	2¼	6	4⅛	2	6¼	7	4¾	2	10¼	8	5¼	3	2¼	9	5⅞
2	2⅜	6	4½	2	6⅜	7	5⅛	2	10⅜	8	5⅝	3	2⅜	9	6¼
2	2½	6	4⅞	2	6½	7	5½	2	10½	8	6	3	2½	9	6⅝
2	2⅝	6	5⅜	2	6⅝	7	5⅞	2	10⅝	8	6½	3	2⅝	9	7
2	2¾	6	5¾	2	6¾	7	6¼	2	10¾	8	6⅞	3	2¾	9	7⅜
2	2⅞	6	6⅛	2	6⅞	7	6⅝	2	10⅞	8	7¼	3	2⅞	9	7⅞
2	3	6	6½	2	7	7	7	2	11	8	7⅝	3	3	9	8¼
2	3⅛	6	6⅞	2	7⅛	7	7½	2	11⅛	8	8	3	3⅛	9	8⅝
2	3¼	6	7¼	2	7¼	7	7⅞	2	11¼	8	8⅜	3	3¼	9	9
2	3⅜	6	7⅝	2	7⅜	7	8¼	2	11⅜	8	8⅞	3	3⅜	9	9⅜
2	3½	6	8⅛	2	7½	7	8⅝	2	11½	8	9¼	3	3½	9	9¾
2	3⅝	6	8½	2	7⅝	7	9	2	11⅝	8	9⅝	3	3⅝	9	10⅛
2	3¾	6	8⅞	2	7¾	7	9⅜	2	11¾	8	10	3	3¾	9	10½
2	3⅞	6	9¼	2	7⅞	7	9¾	2	11⅞	8	10⅜	3	3⅞	9	10⅞
2	4	6	9⅝	2	8	7	10	3	0	8	10¾	3	4	9	11⅜
2	4⅛	6	10	2	8⅛	7	10⅝	3	0⅛	8	11⅛	3	4⅛	9	11¾
2	4¼	6	10½	2	8¼	7	11	3	0¼	8	11½	3	4¼	10	0⅛
2	4⅜	6	10⅞	2	8⅜	7	11⅜	3	0⅜	9	0	3	4⅜	10	0½
2	4½	6	11¼	2	8½	7	11¾	3	0½	9	0⅜	3	4½	10	0⅞
2	4⅝	6	11⅝	2	8⅝	8	0⅛	3	0⅝	9	0¾	3	4⅝	10	1⅜
2	4¾	7	0	2	8¾	8	0½	3	0¾	9	1⅛	3	4¾	10	1¾
2	4⅞	7	0⅜	2	8⅞	8	1	3	0⅞	9	1½	3	4⅞	10	2⅛

For Angle Iron measuring 1 Inch thick, diagonally across the root.

FLANGE INSIDE.

OUTSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.		OUTSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.		OUTSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.		OUTSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.	
FT.	IN.	FT.	IN.	FT	IN.	FT.	IN	FT	IN.	FT.	IN.	FT.	IN.	FT.	IN.
3	5	10	2½	3	9	11	3	4	1	12	3⅝	4	5	13	4¼
3	5⅛	10	2⅞	3	9⅛	11	3½	4	1⅛	12	4	4	5⅛	13	4⅜
3	5¼	10	3	3	9¼	11	3⅞	4	1¼	12	4⅜	4	5¼	13	5
3	5⅜	10	3⅝	3	9⅜	11	4¼	4	1⅜	12	4¾	4	5⅜	13	5⅜
3	5½	10	4	3	9½	11	4⅝	4	1½	12	5¼	4	5½	13	5¾
3	5⅝	10	4½	3	9⅝	11	5	4	1⅝	12	5⅝	4	5⅝	13	6⅛
3	5¾	10	4⅞	3	9¾	11	5⅜	4	1¾	12	6	4	5¾	13	6½
3	5⅞	10	5¼	3	9⅞	11	5¾	4	1⅞	12	6⅜	4	5⅞	13	7
3	6	10	5⅝	3	10	11	6	4	2	12	6¾	4	6	13	7⅜
3	6⅛	10	6	3	10⅛	11	6⅝	4	2⅛	12	7⅛	4	6⅛	13	7¾
3	6¼	10	6⅜	3	10¼	11	7	4	2¼	12	7½	4	6¼	13	8⅛
3	6⅜	10	6⅞	3	10⅜	11	7⅜	4	2⅜	12	7⅞	4	6⅜	13	8½
3	6½	10	7¼	3	10½	11	7¾	4	2½	12	8⅜	4	6½	13	8⅞
3	6⅝	10	7⅝	3	10⅝	11	8⅛	4	2⅝	12	8¾	4	6⅝	13	9¼
3	6¾	10	8	3	10¾	11	8½	4	2¾	12	9⅛	4	6¾	13	9⅝
3	6⅞	10	8⅜	3	10⅞	11	8⅞	4	2⅞	12	9½	4	6⅞	13	10⅛
3	7	10	8¾	3	11	11	9⅜	4	3	12	9⅞	4	7	13	10½
3	7⅛	10	9⅛	3	11⅛	11	9¾	4	3⅛	12	10⅜	4	7⅛	13	10⅞
3	7¼	10	9½	3	11¼	11	10⅛	4	3¼	12	10¾	4	7¼	13	11¼
3	7⅜	10	9⅞	3	11⅜	11	10½	4	3⅜	12	11⅛	4	7⅜	13	11⅝
3	7½	10	10⅜	3	11½	11	10⅞	4	3½	12	11½	4	7½	14	0
3	7⅝	10	10¾	3	11⅝	11	11¼	4	3⅝	12	11⅞	4	7⅝	14	0⅜
3	7¾	10	11⅛	3	11¾	11	11⅝	4	3¾	13	0¼	4	7¾	14	0⅞
3	7⅞	10	11½	3	11⅞	12	0⅛	4	3⅞	13	0⅝	4	7⅞	14	1¼
3	8	10	11⅞	4	0	12	0½	4	4	13	1	4	8	14	1⅝
3	8⅛	11	0⅜	4	0⅛	12	0⅞	4	4⅛	13	1½	4	8⅛	14	2
3	8¼	11	0¾	4	0¼	12	1¼	4	4¼	13	1⅞	4	8¼	14	2⅜
3	8⅜	11	1⅛	4	0⅜	12	1⅝	4	4⅜	13	2¼	4	8⅜	14	2¾
3	8½	11	1½	4	0½	12	2	4	4½	13	2⅝	4	8½	14	3⅛
3	8⅝	11	1⅞	4	0⅝	12	2⅜	4	4⅝	13	3	4	8⅝	14	3½
3	8¾	11	2¼	4	0¾	12	2⅞	4	4¾	13	3⅜	4	8¾	14	4
3	8⅞	11	2⅝	4	0⅞	12	3¼	4	4⅞	13	3¾	4	8⅞	14	4⅜

For Angle Iron measuring 1 Inch thick, diagonally across the root.

FLANGE INSIDE.

OUTSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.		OUTSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.		OUTSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.		OUTSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.	
FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN	FT.	IN.	FT.	IN.	FT.	IN
4	9	14	4¾	5	1	15	5⅜	5	5	16	5⅞	5	9	17	6½
4	9⅛	14	5⅛	5	1⅛	15	5¾	5	5⅛	16	6¼	5	9⅛	17	6⅞
4	9¼	14	5½	5	1¼	15	6⅛	5	5¼	16	6⅝	5	9¼	17	7¼
4	9⅜	14	5⅞	5	1⅜	15	6½	5	5⅜	16	7	5	9⅜	17	7⅝
4	9½	14	6⅜	5	1½	15	6⅞	5	5½	16	7½	5	9½	17	8
4	9⅝	14	6¾	5	1⅝	15	7¼	5	5⅝	16	7⅞	5	9⅝	17	8⅜
4	9¾	14	7⅛	5	1¾	15	7¾	5	5¾	16	8¼	5	9¾	17	8⅞
4	9⅞	14	7½	5	1⅞	15	8⅛	5	5⅞	16	8⅝	5	9⅞	17	9¼
4	10	14	7⅞	5	2	15	8½	5	6	16	9	5	10	17	9⅝
4	10⅛	14	8¼	5	2⅛	15	8⅞	5	6⅛	16	9⅜	5	10⅛	17	10
4	10¼	14	8¾	5	2¼	15	9¼	5	6¼	16	9⅞	5	10¼	17	10⅜
4	10⅜	14	9⅛	5	2⅜	15	9⅝	5	6⅜	16	10¼	5	10⅜	17	10¾
4	10½	14	9½	5	2½	15	10	5	6½	16	10⅝	5	10½	17	11⅛
4	10⅝	14	9⅞	5	2⅝	15	10⅜	5	6⅝	16	11	5	10⅝	17	11½
4	10¾	14	10¼	5	2¾	15	10⅞	5	6¾	16	11⅜	5	10¾	18	0
4	10⅞	14	10⅝	5	2⅞	15	11¼	5	6⅞	16	11¾	5	10⅞	18	0⅜
4	11	14	11	5	3	15	11⅝	5	7	17	0⅛	5	11	18	0¾
4	11⅛	14	11½	5	3⅛	16	0	5	7⅛	17	0⅝	5	11⅛	18	1⅛
4	11¼	14	11⅞	5	3¼	16	0⅜	5	7¼	17	1	5	11¼	18	1½
4	11⅜	15	0¼	5	3⅜	16	0¾	5	7⅜	17	1⅜	5	11⅜	18	1⅞
4	11½	15	0⅝	5	3½	16	1⅛	5	7½	17	1¾	5	11½	18	2⅜
4	11⅝	15	1	5	3⅝	16	1⅝	5	7⅝	17	2⅛	5	11⅝	18	2¾
4	11¾	15	1⅜	5	3¾	16	2	5	7¾	17	2½	5	11¾	18	3⅛
4	11⅞	15	1⅞	5	3⅞	16	2⅜	5	7⅞	17	2⅞	5	11⅞	18	3½
5	0	15	2¼	5	4	16	2¾	5	8	17	3⅜	6	0	18	3⅞
5	0⅛	15	2⅝	5	4⅛	16	3⅛	5	8⅛	17	3¾	6	0⅛	18	4¼
5	0¼	15	3	5	4¼	16	3½	5	8¼	17	4⅛	6	0¼	18	4⅝
5	0⅜	15	3⅜	5	4⅜	16	3⅞	5	8⅜	17	4½	6	0⅜	18	5
5	0½	15	3¾	5	4½	16	4⅜	5	8½	17	4⅞	6	0½	18	5½
5	0⅝	15	4⅛	5	4⅝	16	4¾	5	8⅝	17	5¼	6	0⅝	18	5⅞
5	0¾	15	4½	5	4¾	16	5⅛	5	8¾	17	5⅝	6	0¾	18	6¼
5	0⅞	15	4⅞	5	4⅞	16	5½	5	8⅞	17	6	6	0⅞	18	6⅝

For Angle Iron measuring 1 Inch thick, diagonally across the root.

FLANGE INSIDE.

OUTSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.		OUTSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.		OUTSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.		OUTSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.	
FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN	FT.	IN.	FT.	IN.	FT.	IN.
6	1	18	7	6	5	19	7⅛	6	9	20	8⅛	7	1	21	8¾
6	1⅛	18	7⅜	6	5⅛	19	8	6	9⅛	20	8½	7	1⅛	21	9⅛
6	1¼	18	7⅞	6	5¼	19	8⅜	6	9¼	20	9	7	1¼	21	9½
6	1⅜	18	8¼	6	5⅜	19	8¾	6	9⅜	20	9⅜	7	1⅜	21	9⅞
6	1½	18	8⅝	6	5½	19	9⅛	6	9½	20	9¾	7	1½	21	10⅜
6	1⅝	18	9	6	5⅝	19	9⅝	6	9⅝	20	10¼	7	1⅝	21	10¾
6	1¾	18	9⅜	6	5¾	19	10	6	9¾	20	10½	7	1¾	21	11⅛
6	1⅞	18	9¾	6	5⅞	19	10⅜	6	9⅞	20	10⅞	7	1⅞	21	11½
6	2	18	10⅛	6	6	19	10¾	6	10	20	11⅜	7	2	21	11⅞
6	2⅛	18	10½	6	6⅛	19	11⅛	6	10⅛	20	11¾	7	2⅛	22	0¼
6	2¼	18	11	6	6¼	19	11½	6	10¼	21	0⅛	7	2¼	22	0⅜
6	2⅜	18	11⅜	6	6⅜	19	11⅞	6	10⅜	21	0½	7	2⅜	22	1
6	2½	18	11¾	6	6½	20	0⅜	6	10½	21	0⅞	7	2½	22	1½
6	2⅝	19	0⅛	6	6⅝	20	0¾	6	10⅝	21	1¼	7	2⅝	22	1⅞
6	2¾	19	0½	6	6¾	20	1⅛	6	10¾	21	1⅝	7	2¾	22	2¼
6	2⅞	19	0⅞	6	6⅞	20	1½	6	10⅞	21	2	7	2⅞	22	2⅝
6	3	19	1⅜	6	7	20	1⅞	6	11	21	2½	7	3	22	3
6	3⅛	19	1¾	6	7⅛	20	2¼	6	11⅛	21	2⅞	7	3⅛	22	3⅜
6	3¼	19	2⅛	6	7¼	20	2⅝	6	11¼	21	3¼	7	3¼	22	3⅞
6	3⅜	19	2½	6	7⅜	20	3	6	11⅜	21	3⅝	7	3⅜	22	4¼
6	3½	19	2⅞	6	7½	20	3½	6	11½	21	4	7	3½	22	4⅝
6	3⅝	19	3¼	6	7⅝	20	3⅞	6	11⅝	21	4⅜	7	3⅝	22	5
6	3¾	19	3⅝	6	7¾	20	4¼	6	11¾	21	4¾	7	3¾	22	5⅜
6	3⅞	19	4	6	7⅞	20	4⅝	6	11⅞	21	5⅛	7	3⅞	22	5¾
6	4	19	4½	6	8	20	5	7	0	21	5½	7	4	22	6⅛
6	4⅛	19	4⅞	6	8⅛	20	5⅜	7	0⅛	21	6	7	4⅛	22	6½
6	4¼	19	5¼	6	8¼	20	5⅞	7	0¼	21	6⅜	7	4¼	22	7
6	4⅜	19	5⅝	6	8⅜	20	6¼	7	0⅜	21	6¾	7	4⅜	22	7⅜
6	4½	19	6	6	8½	20	6⅝	7	0½	21	7⅛	7	4½	22	7¾
6	4⅝	19	6⅜	6	8⅝	20	7	7	0⅝	21	7⅝	7	4⅝	22	8⅛
6	4¾	19	6⅞	6	8¾	20	7⅜	7	0¾	21	8	7	4¾	22	8½
6	4⅞	19	7¼	6	8⅞	20	7¾	7	0⅞	21	8⅜	7	4⅞	22	8⅞

For Angle Iron measuring 1 Inch thick, diagonally across the root.

FLANGE INSIDE.

OUTSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.		OUTSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.		OUTSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.		OUTSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.	
FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN	FT.	IN.	FT.	IN.	FT.	IN
7	5	22	9¼	7	9	23	9⅞	8	1	24	10½	8	5	25	11
7	5⅛	22	9¾	7	9⅛	23	10¼	8	1⅛	24	10⅞	8	5⅛	25	11⅜
7	5¼	22	10⅛	7	9¼	23	10⅝	8	1¼	24	11¼	8	5¼	25	11¾
7	5⅜	22	10½	7	9⅜	23	11	8	1⅜	24	11⅝	8	5⅜	26	0⅛
7	5½	22	10⅞	7	9½	23	11½	8	1½	25	0	8	5½	26	0⅝
7	5⅝	22	11¼	7	9⅝	23	11⅞	8	1⅝	25	0⅜	8	5⅝	26	1
7	5¾	22	11⅝	7	9¾	24	0¼	8	1¾	25	0¾	8	5¾	26	1⅜
7	5⅞	23	0	7	9⅞	24	0⅝	8	1⅞	25	1¼	8	5⅞	26	1¾
7	6	23	0½	7	10	24	1	8	2	25	1⅝	8	6	26	2⅛
7	6⅛	23	0⅞	7	10⅛	24	1⅜	8	2⅛	25	2	8	6⅛	26	2½
7	6¼	23	1¼	7	10¼	24	1¾	8	2¼	25	2⅜	8	6¼	26	2⅞
7	6⅜	23	1⅝	7	10⅜	24	2¼	8	2⅜	25	2¾	8	6⅜	26	3⅜
7	6½	23	2	7	10½	24	2⅝	8	2½	25	3⅛	8	6½	26	3¾
7	6⅝	23	2⅜	7	10⅝	24	3	8	2⅝	25	3½	8	6⅝	26	4⅛
7	6¾	23	2¾	7	10¾	24	3⅜	8	2¾	25	3⅞	8	6¾	26	4½
7	6⅞	23	3¼	7	10⅞	24	3¾	8	2⅞	25	4⅜	8	6⅞	26	4⅞
7	7	23	3⅝	7	11	24	4⅛	8	3	25	4¾	8	7	26	5¼
7	7⅛	23	4	7	11⅛	24	4½	8	3⅛	25	5⅛	8	7⅛	26	5⅝
7	7¼	23	4⅜	7	11¼	24	4⅞	8	3¼	25	5½	8	7¼	26	6
7	7⅜	23	4¾	7	11⅜	24	5⅜	8	3⅜	25	5⅞	8	7⅜	26	6½
7	7½	23	5⅛	7	11½	24	5[illegible]	8	3½	25	6¼	8	7½	26	6⅞
7	7⅝	23	5½	7	11⅝	24	6⅛	8	3⅝	25	6⅝	8	7⅝	26	7¼
7	7¾	23	6	7	11¾	24	6½	8	3¾	25	7	8	7¾	26	7⅝
7	7⅞	23	6⅜	7	11⅞	24	6[illegible]	8	3⅞	25	7½	8	7⅞	26	8
7	8	23	6¾	8	0	24	7¼	8	4	25	7⅞	8	8	26	8⅜
7	8⅛	23	7⅛	8	0⅛	24	7⅝	8	4⅛	25	8¼	8	8⅛	26	8⅞
7	8¼	23	7½	8	0¼	24	8	8	4¼	25	8⅝	8	8¼	26	9¼
7	8⅜	23	7⅞	8	0⅜	24	8½	8	4⅜	25	9	8	8⅜	26	9⅝
7	8½	23	8¼	8	0½	24	8⅞	8	4½	25	9½	8	8½	26	10
7	8⅝	23	8¾	8	0⅝	24	9¼	8	4⅝	25	9⅞	8	8⅝	26	10⅜
7	8¾	23	9⅛	8	0¾	24	9⅝	8	4¾	25	10¼	8	8¾	26	10¾
7	8⅞	23	9½	8	0⅞	24	10	8	4⅞	25	10⅝	8	8⅞	26	11⅛

TABLE XVII.

For Angle Iron measuring $1\frac{1}{8}$ of an Inch thick, diagonally across the root

FLANGE INSIDE.

OUTSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.		OUTSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.		OUTSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.		OUTSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.	
FT.	IN.	FT.	IN.	FT	IN.	FT.	IN	FT	IN.	FT.	IN.	FT.	IN.	FT.	IN.
0	9	1	$9\frac{1}{8}$	1	1	2	$9\frac{3}{4}$	1	5	3	$10\frac{3}{8}$	1	9	4	$10\frac{7}{8}$
0	$9\frac{1}{8}$	1	$9\frac{1}{2}$	1	$1\frac{1}{8}$	2	$10\frac{1}{8}$	1	$5\frac{1}{8}$	3	$10\frac{3}{4}$	1	$9\frac{1}{8}$	4	$11\frac{1}{4}$
0	$9\frac{1}{4}$	1	10	1	$1\frac{1}{4}$	2	$10\frac{1}{2}$	1	$5\frac{1}{4}$	3	$11\frac{1}{8}$	1	$9\frac{1}{4}$	4	$11\frac{5}{8}$
0	$9\frac{3}{8}$	1	$10\frac{3}{8}$	1	$1\frac{3}{8}$	2	$10\frac{7}{8}$	1	$5\frac{3}{8}$	3	$11\frac{1}{2}$	1	$9\frac{3}{8}$	5	0
0	$9\frac{1}{2}$	1	$10\frac{3}{4}$	1	$1\frac{1}{2}$	2	$11\frac{3}{8}$	1	$5\frac{1}{2}$	3	$11\frac{7}{8}$	1	$9\frac{1}{2}$	5	$0\frac{3}{8}$
0	$9\frac{5}{8}$	1	$11\frac{1}{8}$	1	$1\frac{5}{8}$	2	$11\frac{3}{4}$	1	$5\frac{5}{8}$	4	$0\frac{1}{8}$	1	$9\frac{5}{8}$	5	$0\frac{7}{8}$
0	$9\frac{3}{4}$	1	$11\frac{1}{2}$	1	$1\frac{3}{4}$	3	$0\frac{1}{8}$	1	$5\frac{3}{4}$	4	$0\frac{5}{8}$	1	$9\frac{3}{4}$	5	$1\frac{1}{4}$
0	$9\frac{7}{8}$	1	$11\frac{7}{8}$	1	$1\frac{7}{8}$	3	$0\frac{1}{2}$	1	$5\frac{7}{8}$	4	1	1	$9\frac{7}{8}$	5	$1\frac{5}{8}$
0	10	2	$0\frac{3}{8}$	1	2	3	$0\frac{7}{8}$	1	6	4	$1\frac{3}{8}$	1	10	5	2
0	$10\frac{1}{8}$	2	$0\frac{3}{4}$	1	$2\frac{1}{8}$	3	$1\frac{1}{4}$	1	$6\frac{1}{8}$	4	$1\frac{7}{8}$	1	$10\frac{1}{8}$	5	$2\frac{3}{8}$
0	$10\frac{1}{4}$	2	$1\frac{1}{8}$	1	$2\frac{1}{4}$	3	$1\frac{5}{8}$	1	$6\frac{1}{4}$	4	$2\frac{1}{4}$	1	$10\frac{1}{4}$	5	$2\frac{3}{4}$
0	$10\frac{3}{8}$	2	$1\frac{1}{2}$	1	$2\frac{3}{8}$	3	2	1	$6\frac{3}{8}$	4	$2\frac{5}{8}$	1	$10\frac{3}{8}$	5	$3\frac{1}{8}$
0	$10\frac{1}{2}$	2	$1\frac{7}{8}$	1	$2\frac{1}{2}$	3	$2\frac{1}{2}$	1	$6\frac{1}{2}$	4	3	1	$10\frac{1}{2}$	5	$3\frac{5}{8}$
0	$10\frac{5}{8}$	2	$2\frac{3}{8}$	1	$2\frac{5}{8}$	3	$2\frac{7}{8}$	1	$6\frac{5}{8}$	4	$3\frac{3}{8}$	1	$10\frac{5}{8}$	5	4
0	$10\frac{3}{4}$	2	$2\frac{3}{4}$	1	$2\frac{3}{4}$	3	$3\frac{1}{4}$	1	$6\frac{3}{4}$	4	$3\frac{3}{4}$	1	$10\frac{3}{4}$	5	$4\frac{3}{8}$
0	$10\frac{7}{8}$	2	$3\frac{1}{8}$	1	$2\frac{7}{8}$	3	$3\frac{5}{8}$	1	$6\frac{7}{8}$	4	$4\frac{1}{8}$	1	$10\frac{7}{8}$	5	$4\frac{3}{4}$
0	11	2	$3\frac{1}{2}$	1	3	3	4	1	7	4	$4\frac{1}{2}$	1	11	5	$5\frac{1}{8}$
0	$11\frac{1}{8}$	2	$3\frac{7}{8}$	1	$3\frac{1}{8}$	3	$4\frac{3}{8}$	1	$7\frac{1}{8}$	4	5	1	$11\frac{1}{8}$	5	$5\frac{1}{2}$
0	$11\frac{1}{4}$	2	$4\frac{1}{4}$	1	$3\frac{1}{4}$	3	$4\frac{7}{8}$	1	$7\frac{1}{4}$	4	$5\frac{3}{8}$	1	$11\frac{1}{4}$	5	$5\frac{7}{8}$
0	$11\frac{3}{8}$	2	$4\frac{5}{8}$	1	$3\frac{3}{8}$	3	$5\frac{1}{4}$	1	$7\frac{3}{8}$	4	$5\frac{3}{4}$	1	$11\frac{3}{8}$	5	$6\frac{3}{8}$
0	$11\frac{1}{2}$	2	5	1	$3\frac{1}{2}$	3	$5\frac{5}{8}$	1	$7\frac{1}{2}$	4	$6\frac{1}{8}$	1	$11\frac{1}{2}$	5	$6\frac{3}{4}$
0	$11\frac{5}{8}$	2	$5\frac{1}{2}$	1	$3\frac{5}{8}$	3	6	1	$7\frac{5}{8}$	4	$6\frac{1}{2}$	1	$11\frac{5}{8}$	5	$7\frac{1}{8}$
0	$11\frac{3}{4}$	2	$5\frac{7}{8}$	1	$3\frac{3}{4}$	3	$6\frac{3}{8}$	1	$7\frac{3}{4}$	4	7	1	$11\frac{3}{4}$	5	$7\frac{1}{2}$
0	$11\frac{7}{8}$	2	$6\frac{1}{4}$	1	$3\frac{7}{8}$	3	$6\frac{3}{4}$	1	$7\frac{7}{8}$	4	$7\frac{3}{8}$	1	$11\frac{7}{8}$	5	8
1	0	2	$6\frac{5}{8}$	1	4	3	$7\frac{1}{8}$	1	8	4	$7\frac{3}{4}$	2	0	5	$8\frac{3}{8}$
1	$0\frac{1}{8}$	2	7	1	$4\frac{1}{8}$	3	$7\frac{5}{8}$	1	$8\frac{1}{8}$	4	$8\frac{1}{8}$	2	$0\frac{1}{8}$	5	$8\frac{3}{4}$
1	$0\frac{1}{4}$	2	$7\frac{3}{8}$	1	$4\frac{1}{4}$	3	8	1	$8\frac{1}{4}$	4	$8\frac{1}{2}$	2	$0\frac{1}{4}$	5	$9\frac{1}{8}$
1	$0\frac{3}{8}$	2	$7\frac{3}{4}$	1	$4\frac{3}{8}$	3	$8\frac{3}{8}$	1	$8\frac{3}{8}$	4	$8\frac{7}{8}$	2	$0\frac{3}{8}$	5	$9\frac{1}{2}$
1	$0\frac{1}{2}$	2	$8\frac{1}{4}$	1	$4\frac{1}{2}$	3	$8\frac{3}{4}$	1	$8\frac{1}{2}$	4	$9\frac{1}{4}$	2	$0\frac{1}{2}$	5	$9\frac{7}{8}$
1	$0\frac{5}{8}$	2	$8\frac{5}{8}$	1	$4\frac{5}{8}$	3	$9\frac{1}{8}$	1	$8\frac{5}{8}$	4	$9\frac{5}{8}$	2	$0\frac{5}{8}$	5	$10\frac{1}{4}$
1	$0\frac{3}{4}$	2	9	1	$4\frac{3}{4}$	3	$9\frac{1}{2}$	1	$8\frac{3}{4}$	4	10	2	$0\frac{3}{4}$	5	$10\frac{5}{8}$
1	$0\frac{7}{8}$	2	$9\frac{3}{8}$	1	$4\frac{7}{8}$	3	$9\frac{7}{8}$	1	$8\frac{7}{8}$	4	$10\frac{1}{4}$	2	$0\frac{7}{8}$	5	11

For ANGLE IRON measuring $1\frac{1}{8}$ of an Inch thick, diagonally across the root.

FLANGE INSIDE.

OUTSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.		OUTSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.		OUTSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.		OUTSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.	
FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.
2	1	5	$11\frac{1}{2}$	2	5	7	0	2	9	8	$0\frac{1}{2}$	3	1	9	$1\frac{1}{8}$
2	$1\frac{1}{8}$	5	$11\frac{7}{8}$	2	$5\frac{1}{8}$	7	$0\frac{3}{8}$	2	$9\frac{1}{8}$	8	1	3	$1\frac{1}{8}$	9	$1\frac{1}{2}$
2	$1\frac{1}{4}$	6	$0\frac{1}{4}$	2	$5\frac{1}{4}$	7	$0\frac{3}{4}$	2	$9\frac{1}{4}$	8	$1\frac{3}{8}$	3	$1\frac{1}{4}$	9	$1\frac{7}{8}$
2	$1\frac{3}{8}$	6	$0\frac{5}{8}$	2	$5\frac{7}{8}$	7	$1\frac{1}{8}$	2	$9\frac{3}{8}$	8	$1\frac{3}{4}$	3	$1\frac{3}{8}$	9	$2\frac{3}{8}$
2	$1\frac{1}{2}$	6	1	2	$5\frac{1}{2}$	7	$1\frac{1}{2}$	2	$9\frac{1}{2}$	8	$2\frac{1}{8}$	3	$1\frac{1}{2}$	9	$2\frac{3}{4}$
2	$1\frac{5}{8}$	6	$1\frac{3}{8}$	2	$5\frac{5}{8}$	7	2	2	$9\frac{5}{8}$	8	$2\frac{1}{2}$	3	$1\frac{5}{8}$	9	$3\frac{1}{8}$
2	$1\frac{3}{4}$	6	$1\frac{3}{4}$	2	$5\frac{3}{4}$	7	$2\frac{3}{8}$	2	$9\frac{3}{4}$	8	$2\frac{7}{8}$	3	$1\frac{3}{4}$	9	$3\frac{1}{2}$
2	$1\frac{7}{8}$	6	$2\frac{1}{4}$	2	$5\frac{7}{8}$	7	$2\frac{3}{4}$	2	$9\frac{7}{8}$	8	$3\frac{3}{8}$	3	$1\frac{7}{8}$	9	$3\frac{7}{8}$
2	2	6	$2\frac{5}{8}$	2	6	7	$3\frac{1}{8}$	2	10	8	$3\frac{3}{4}$	3	2	9	$4\frac{1}{4}$
2	$2\frac{1}{8}$	6	3	2	$6\frac{1}{8}$	7	$3\frac{1}{2}$	2	$10\frac{1}{8}$	8	$4\frac{1}{8}$	3	$2\frac{1}{8}$	9	$4\frac{5}{8}$
2	$2\frac{1}{4}$	6	$3\frac{3}{8}$	2	$6\frac{1}{4}$	7	$3\frac{7}{8}$	2	$10\frac{1}{4}$	8	$4\frac{1}{2}$	3	$2\frac{1}{4}$	9	5
2	$2\frac{3}{8}$	6	$3\frac{3}{4}$	2	$6\frac{3}{8}$	7	$4\frac{3}{8}$	2	$10\frac{3}{8}$	8	$4\frac{7}{8}$	3	$2\frac{3}{8}$	9	$5\frac{1}{2}$
2	$2\frac{1}{2}$	6	$4\frac{1}{8}$	2	$6\frac{1}{2}$	7	$4\frac{3}{4}$	2	$10\frac{1}{2}$	8	$5\frac{1}{4}$	3	$2\frac{1}{2}$	9	$5\frac{7}{8}$
2	$2\frac{5}{8}$	6	$4\frac{1}{2}$	2	$6\frac{5}{8}$	7	$5\frac{1}{8}$	2	$10\frac{5}{8}$	8	$5\frac{5}{8}$	3	$2\frac{5}{8}$	9	$6\frac{1}{4}$
2	$2\frac{3}{4}$	6	$4\frac{7}{8}$	2	$6\frac{3}{4}$	7	$5\frac{1}{2}$	2	$10\frac{3}{4}$	8	6	3	$2\frac{3}{4}$	9	$6\frac{5}{8}$
2	$2\frac{7}{8}$	6	$5\frac{3}{8}$	2	$6\frac{7}{8}$	7	$5\frac{7}{8}$	2	$10\frac{7}{8}$	8	$6\frac{1}{2}$	3	$2\frac{7}{8}$	9	7
2	3	6	$5\frac{3}{4}$	2	7	7	$6\frac{1}{4}$	2	11	8	$6\frac{7}{8}$	3	3	9	$7\frac{3}{8}$
2	$3\frac{1}{8}$	6	$6\frac{1}{8}$	2	$7\frac{1}{8}$	7	$6\frac{5}{8}$	2	$11\frac{1}{8}$	8	$7\frac{1}{4}$	3	$3\frac{1}{8}$	9	$7\frac{7}{8}$
2	$3\frac{1}{4}$	6	$6\frac{1}{2}$	2	$7\frac{1}{4}$	7	7	2	$11\frac{1}{4}$	8	$7\frac{5}{8}$	3	$3\frac{1}{4}$	9	$8\frac{1}{4}$
2	$3\frac{3}{8}$	6	$6\frac{7}{8}$	2	$7\frac{3}{8}$	7	$7\frac{1}{2}$	2	$11\frac{3}{8}$	8	8	3	$3\frac{3}{8}$	9	$8\frac{5}{8}$
2	$3\frac{1}{2}$	6	$7\frac{1}{4}$	2	$7\frac{1}{2}$	7	$7\frac{7}{8}$	2	$11\frac{1}{2}$	8	$8\frac{3}{8}$	3	$3\frac{1}{2}$	9	9
2	$3\frac{5}{8}$	6	$7\frac{5}{8}$	2	$7\frac{5}{8}$	7	$8\frac{1}{4}$	2	$11\frac{5}{8}$	8	$8\frac{7}{8}$	3	$3\frac{5}{8}$	9	$9\frac{3}{8}$
2	$3\frac{3}{4}$	6	$8\frac{1}{8}$	2	$7\frac{3}{4}$	7	$8\frac{5}{8}$	2	$11\frac{3}{4}$	8	$9\frac{1}{4}$	3	$3\frac{3}{4}$	9	$9\frac{1}{4}$
2	$3\frac{7}{8}$	6	$8\frac{1}{2}$	2	$7\frac{7}{8}$	7	9	2	$11\frac{7}{8}$	8	$9\frac{5}{8}$	3	$3\frac{7}{8}$	9	$10\frac{1}{8}$
2	4	6	$8\frac{7}{8}$	2	8	7	$9\frac{3}{8}$	3	0	8	10	3	4	9	$10\frac{1}{2}$
2	$4\frac{1}{8}$	6	$9\frac{1}{4}$	2	$8\frac{1}{8}$	7	$9\frac{3}{4}$	3	$0\frac{1}{8}$	8	$10\frac{3}{8}$	3	$4\frac{1}{8}$	9	$10\frac{7}{8}$
2	$4\frac{1}{4}$	6	$9\frac{5}{8}$	2	$8\frac{1}{4}$	7	$10\frac{1}{4}$	3	$0\frac{1}{4}$	8	$10\frac{3}{4}$	3	$4\frac{1}{4}$	9	$11\frac{3}{8}$
2	$4\frac{3}{8}$	6	10	2	$8\frac{3}{8}$	7	$10\frac{5}{8}$	3	$0\frac{3}{8}$	8	$11\frac{1}{8}$	3	$4\frac{3}{8}$	9	$11\frac{3}{4}$
2	$4\frac{1}{2}$	6	$10\frac{1}{2}$	2	$8\frac{1}{2}$	7	11	3	$0\frac{1}{2}$	8	$11\frac{1}{2}$	3	$4\frac{1}{2}$	10	$0\frac{1}{8}$
2	$4\frac{5}{8}$	6	$10\frac{7}{8}$	2	$8\frac{5}{8}$	7	$11\frac{3}{8}$	3	$0\frac{5}{8}$	9	0	3	$4\frac{5}{8}$	10	$0\frac{1}{2}$
2	$4\frac{3}{4}$	6	$11\frac{1}{4}$	2	$8\frac{3}{4}$	7	$11\frac{3}{4}$	3	$0\frac{3}{4}$	9	$0\frac{3}{8}$	3	$4\frac{3}{4}$	10	$0\frac{7}{8}$
2	$4\frac{7}{8}$	6	$11\frac{3}{8}$	2	$8\frac{7}{8}$	8	$0\frac{1}{8}$	3	$0\frac{7}{8}$	9	$0\frac{3}{4}$	3	$4\frac{7}{8}$	10	$1\frac{3}{8}$

For ANGLE IRON measuring $1\frac{1}{8}$ of an Inch thick, diagonally across the root.

FLANGE INSIDE.

OUTSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.		OUTSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.		OUTSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.		OUTSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.	
FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.
3	5	10	$1\frac{3}{4}$	3	9	11	$2\frac{1}{4}$	4	1	12	$2\frac{7}{8}$	4	5	13	$3\frac{3}{8}$
3	$5\frac{1}{8}$	10	$2\frac{1}{8}$	3	$9\frac{1}{8}$	11	$2\frac{5}{8}$	4	$1\frac{1}{8}$	12	$3\frac{1}{4}$	4	$5\frac{1}{8}$	13	$3\frac{3}{4}$
3	$5\frac{1}{4}$	10	$2\frac{1}{2}$	3	$9\frac{1}{4}$	11	3	4	$1\frac{1}{4}$	12	$3\frac{5}{8}$	4	$5\frac{1}{4}$	13	$4\frac{1}{4}$
3	$5\frac{3}{8}$	10	$2\frac{7}{8}$	3	$9\frac{3}{8}$	11	$3\frac{1}{2}$	4	$1\frac{3}{8}$	12	4	4	$5\frac{3}{8}$	13	$4\frac{5}{8}$
3	$5\frac{1}{2}$	10	$3\frac{1}{4}$	3	$9\frac{1}{2}$	11	$3\frac{7}{8}$	4	$1\frac{1}{2}$	12	$4\frac{3}{8}$	4	$5\frac{1}{2}$	13	5
3	$5\frac{5}{8}$	10	$3\frac{5}{8}$	3	$9\frac{5}{8}$	11	$4\frac{1}{4}$	4	$1\frac{5}{8}$	12	$4\frac{3}{4}$	4	$5\frac{5}{8}$	13	$5\frac{3}{8}$
3	$5\frac{3}{4}$	10	4	3	$9\frac{3}{4}$	11	$4\frac{5}{8}$	4	$1\frac{3}{4}$	12	$5\frac{1}{4}$	4	$5\frac{3}{4}$	13	$5\frac{3}{4}$
3	$5\frac{7}{8}$	10	$4\frac{1}{2}$	3	$9\frac{7}{8}$	11	5	4	$1\frac{7}{8}$	12	$5\frac{5}{8}$	4	$5\frac{7}{8}$	13	$6\frac{1}{8}$
3	6	10	$4\frac{7}{8}$	3	10	11	$5\frac{3}{8}$	4	2	12	6	4	6	13	$6\frac{1}{2}$
3	$6\frac{1}{8}$	10	$5\frac{1}{4}$	3	$10\frac{1}{8}$	11	$5\frac{3}{4}$	4	$2\frac{1}{8}$	12	$6\frac{3}{8}$	4	$6\frac{1}{8}$	13	7
3	$6\frac{1}{4}$	10	$5\frac{5}{8}$	3	$10\frac{1}{4}$	11	$6\frac{1}{4}$	4	$2\frac{1}{4}$	12	$6\frac{3}{4}$	4	$6\frac{1}{4}$	13	$7\frac{3}{8}$
3	$6\frac{3}{8}$	10	6	3	$10\frac{3}{8}$	11	$6\frac{5}{8}$	4	$2\frac{3}{8}$	12	$7\frac{1}{8}$	4	$6\frac{3}{8}$	13	$7\frac{3}{4}$
3	$6\frac{1}{2}$	10	$6\frac{3}{8}$	3	$10\frac{1}{2}$	11	7	4	$2\frac{1}{2}$	12	$7\frac{1}{2}$	4	$6\frac{1}{2}$	13	$8\frac{1}{8}$
3	$6\frac{5}{8}$	10	$6\frac{7}{8}$	3	$10\frac{5}{8}$	11	$7\frac{3}{8}$	4	$2\frac{5}{8}$	12	$7\frac{7}{8}$	4	$6\frac{5}{8}$	13	$8\frac{1}{2}$
3	$6\frac{3}{4}$	10	$7\frac{1}{4}$	3	$10\frac{3}{4}$	11	$7\frac{3}{4}$	4	$2\frac{3}{4}$	12	$8\frac{3}{8}$	4	$6\frac{3}{4}$	13	$8\frac{7}{8}$
3	$6\frac{7}{8}$	10	$7\frac{3}{8}$	3	$10\frac{7}{8}$	11	$8\frac{1}{8}$	4	$2\frac{7}{8}$	12	$8\frac{3}{4}$	4	$6\frac{7}{8}$	13	$9\frac{1}{4}$
3	7	10	8	3	11	11	$8\frac{1}{2}$	4	3	12	$9\frac{1}{8}$	4	7	13	$9\frac{5}{8}$
3	$7\frac{1}{8}$	10	$8\frac{3}{8}$	3	$11\frac{1}{8}$	11	$8\frac{7}{8}$	4	$3\frac{1}{8}$	12	$9\frac{1}{2}$	4	$7\frac{1}{8}$	13	$10\frac{1}{8}$
3	$7\frac{1}{4}$	10	$8\frac{3}{4}$	3	$11\frac{1}{4}$	11	$9\frac{3}{8}$	4	$3\frac{1}{4}$	12	$9\frac{7}{8}$	4	$7\frac{1}{4}$	13	$10\frac{1}{2}$
3	$7\frac{3}{8}$	10	$9\frac{1}{8}$	3	$11\frac{3}{8}$	11	$9\frac{3}{4}$	4	$3\frac{3}{8}$	12	$10\frac{3}{8}$	4	$7\frac{3}{8}$	13	$10\frac{7}{8}$
3	$7\frac{1}{2}$	10	$9\frac{1}{2}$	3	$11\frac{1}{2}$	11	$10\frac{1}{8}$	4	$3\frac{1}{2}$	12	$10\frac{3}{4}$	4	$7\frac{1}{2}$	13	$11\frac{1}{4}$
3	$7\frac{5}{8}$	10	$9\frac{7}{8}$	3	$11\frac{5}{8}$	11	$10\frac{1}{2}$	4	$3\frac{5}{8}$	12	$11\frac{1}{8}$	4	$7\frac{5}{8}$	13	$11\frac{5}{8}$
3	$7\frac{3}{4}$	10	$10\frac{3}{8}$	3	$11\frac{3}{4}$	11	$10\frac{7}{8}$	4	$3\frac{3}{4}$	12	$11\frac{1}{2}$	4	$7\frac{3}{4}$	14	0
3	$7\frac{7}{8}$	10	$10\frac{3}{4}$	3	$11\frac{7}{8}$	11	$11\frac{1}{4}$	4	$3\frac{7}{8}$	12	$11\frac{7}{8}$	4	$7\frac{7}{8}$	14	$0\frac{3}{8}$
3	8	10	$11\frac{1}{8}$	4	0	11	$11\frac{3}{8}$	4	4	13	$0\frac{1}{4}$	4	8	14	$0\frac{7}{8}$
3	$8\frac{1}{8}$	10	$11\frac{1}{2}$	4	$0\frac{1}{8}$	12	$0\frac{1}{8}$	4	$4\frac{1}{8}$	13	$0\frac{5}{8}$	4	$8\frac{1}{8}$	14	$1\frac{1}{4}$
3	$8\frac{1}{4}$	10	$11\frac{7}{8}$	4	$0\frac{1}{4}$	12	$0\frac{1}{2}$	4	$4\frac{1}{4}$	13	1	4	$8\frac{1}{4}$	14	$1\frac{5}{8}$
3	$8\frac{3}{8}$	11	$0\frac{3}{8}$	4	$0\frac{3}{8}$	12	$0\frac{7}{8}$	4	$4\frac{3}{8}$	13	$1\frac{1}{2}$	4	$8\frac{3}{8}$	14	2
3	$8\frac{1}{2}$	11	$0\frac{3}{4}$	4	$0\frac{1}{2}$	12	$1\frac{1}{4}$	4	$4\frac{1}{2}$	13	$1\frac{7}{8}$	4	$8\frac{1}{2}$	14	$2\frac{3}{8}$
3	$8\frac{5}{8}$	11	$1\frac{1}{8}$	4	$0\frac{5}{8}$	12	$1\frac{5}{8}$	4	$4\frac{5}{8}$	13	$2\frac{1}{4}$	4	$8\frac{5}{8}$	14	$2\frac{3}{4}$
3	$8\frac{3}{4}$	11	$1\frac{1}{2}$	4	$0\frac{3}{4}$	12	2	4	$4\frac{3}{4}$	13	$2\frac{5}{8}$	4	$8\frac{3}{4}$	14	$3\frac{1}{8}$
3	$8\frac{7}{8}$	11	$1\frac{7}{8}$	4	$0\frac{7}{8}$	12	$2\frac{3}{8}$	4	$4\frac{7}{8}$	13	3	4	$8\frac{7}{8}$	14	$3\frac{1}{2}$

For Angle Iron measuring 1⅛ Inch thick, diagonally across the root.

FLANGE INSIDE.

OUTSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.		OUTSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.		OUTSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.		OUTSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.	
FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN
4	9	14	4	5	1	15	4½	5	5	16	5⅛	5	9	17	5⅝
4	9⅛	14	4⅜	5	1⅛	15	4⅞	5	5⅛	16	5½	5	9⅛	17	6
4	9¼	14	4¾	5	1¼	15	5⅜	5	5¼	16	5⅞	5	9¼	17	6½
4	9⅜	14	5⅛	5	1⅜	15	5¾	5	5⅜	16	6¼	5	9⅜	17	6⅞
4	9½	14	5½	5	1½	15	6⅛	5	5½	16	6⅝	5	9½	17	7¼
4	9⅝	14	5⅞	5	1⅝	15	6½	5	5⅝	16	7	5	9⅝	17	7⅝
4	9¾	14	6⅜	5	1¾	15	6⅞	5	5¾	16	7½	5	9¾	17	8
4	9⅞	14	6¾	5	1⅞	15	7¼	5	5⅞	16	7⅞	5	9⅞	17	8⅜
4	10	14	7⅛	5	2	15	7¾	5	6	16	8¼	5	10	17	8⅞
4	10⅛	14	7½	5	2⅛	15	8⅛	5	6⅛	16	8⅝	5	10⅛	17	9¼
4	10¼	14	7⅞	5	2¼	15	8½	5	6¼	16	9	5	10¼	17	9⅝
4	10⅜	14	8¼	5	2⅜	15	8⅞	5	6⅜	16	9⅜	5	10⅜	17	10
4	10½	14	8¾	5	2½	15	9¼	5	6½	16	9⅞	5	10½	17	10⅜
4	10⅝	14	9⅛	5	2⅝	15	9⅝	5	6⅝	16	10¼	5	10⅝	17	10¾
4	10¾	14	9½	5	2¾	15	10	5	6¾	16	10⅝	5	10¾	17	11⅛
4	10⅞	14	9⅞	5	2⅞	15	10⅜	5	6⅞	16	11	5	10⅞	17	11½
4	11	14	10¼	5	3	15	10⅞	5	7	16	11⅜	5	11	18	0
4	11⅛	14	10⅝	5	3⅛	15	11¼	5	7⅛	16	11¾	5	11⅛	18	0⅜
4	11¼	14	11	5	3¼	15	11⅝	5	7¼	17	0⅛	5	11¼	18	0¾
4	11⅜	14	11½	5	3⅜	16	0	5	7⅜	17	0⅝	5	11⅜	18	1⅛
4	11½	14	11⅞	5	3½	16	0⅜	5	7½	17	1	5	11½	18	1½
4	11⅝	15	0¼	5	3⅝	16	0¾	5	7⅝	17	1⅜	5	11⅝	18	1⅞
4	11¾	15	0⅝	5	3¾	16	1⅛	5	7¾	17	1¾	5	11¾	18	2⅜
4	11⅞	15	1	5	3⅞	16	1⅝	5	7⅞	17	2⅛	5	11⅞	18	2⅞
5	0	15	1⅜	5	4	16	2	5	8	17	2½	6	0	18	3⅛
5	0⅛	15	1⅞	5	4⅛	16	2⅜	5	8⅛	17	2⅞	6	0⅛	18	3½
5	0¼	15	2¼	5	4¼	16	2¾	5	8¼	17	3⅜	6	0¼	18	3⅞
5	0⅜	15	2⅝	5	4⅜	16	3⅛	5	8⅜	17	3¾	6	0⅜	18	4¼
5	0½	15	3	5	4½	16	3½	5	8½	17	4⅛	6	0½	18	4⅝
5	0⅝	15	3⅜	5	4⅝	16	3⅞	5	8⅝	17	4½	6	0⅝	18	5
5	0¾	15	3¾	5	4¾	16	4⅜	5	8¾	17	4⅞	6	0¾	18	5½
5	0⅞	15	4⅛	5	4⅞	16	4¾	5	8⅞	17	5¼	6	0⅞	18	5⅞

For Angle Iron measuring 1⅛ Inch thick, diagonally across the root.

FLANGE INSIDE.

OUTSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.		OUTSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.		OUTSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.		OUTSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.	
FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN
6	1	18	6¼	6	5	19	6⅞	6	9	20	7⅜	7	1	21	8
6	1⅛	18	6⅜	6	5⅛	19	7¼	6	9⅛	20	7¾	7	1⅛	21	8⅜
6	1¼	18	7	6	5¼	19	7⅝	6	9¼	20	8⅛	7	1¼	21	8¾
6	1⅜	18	7⅜	6	5⅜	19	8	6	9⅜	20	8½	7	1⅜	21	9⅛
6	1½	18	7⅞	6	5½	19	8⅜	6	9½	20	9	7	1½	21	9½
6	1⅝	18	8¼	6	5⅝	19	8¾	6	9⅝	20	9⅜	7	1⅝	21	9⅞
6	1¾	18	8⅝	6	5¾	19	9⅛	6	9¾	20	9¾	7	1¾	21	10⅜
6	1⅞	18	9	6	5⅞	19	9⅝	6	9⅞	20	10⅛	7	1⅞	21	10¾
6	2	18	9⅜	6	6	19	10	6	10	20	10½	7	2	21	11⅛
6	2⅛	18	9¾	6	6⅛	19	10⅜	6	10⅛	20	10⅞	7	2⅛	21	11½
6	2¼	18	10⅛	6	6¼	19	10¾	6	10¼	20	11⅜	7	2¼	21	11⅞
6	2⅜	18	10½	6	6⅜	19	11⅛	6	10⅜	20	11¾	7	2⅜	22	0¼
6	2½	18	11	6	6½	19	11½	6	10½	21	0⅛	7	2½	22	0⅝
6	2⅝	18	11⅜	6	6⅝	19	11⅞	6	10⅝	21	0½	7	2⅝	22	1
6	2¾	18	11¾	6	6¾	20	0⅜	6	10¾	21	0⅞	7	2¾	22	1½
6	2⅞	19	0⅛	6	6⅞	20	0¾	6	10⅞	21	1¼	7	2⅞	22	1⅞
6	3	19	0½	6	7	20	1⅛	6	11	21	1⅝	7	3	22	2¼
6	3⅛	19	0⅞	6	7⅛	20	1½	6	11⅛	21	2	7	3⅛	22	2⅝
6	3¼	19	1⅜	6	7¼	20	1⅞	6	11¼	21	2½	7	3¼	22	3
6	3⅜	19	1¾	6	7⅜	20	2¼	6	11⅜	21	2⅞	7	3⅜	22	3⅜
6	3½	19	2⅛	6	7½	20	2⅝	6	11½	21	3¼	7	3½	22	3⅞
6	3⅝	19	2½	6	7⅝	20	3	6	11⅝	21	3⅝	7	3⅝	22	4¼
6	3¾	19	2⅞	6	7¾	20	3½	6	11¾	21	4	7	3¾	22	4⅝
6	3⅞	19	3¼	6	7⅞	20	3⅞	6	11⅞	21	4⅜	7	3⅞	22	5
6	4	19	3⅝	6	8	20	4¼	7	0	21	4¾	7	4	22	5⅜
6	4⅛	19	4	6	8⅛	20	4⅝	7	0⅛	21	5⅛	7	4⅛	22	5¾
6	4¼	19	4½	6	8¼	20	5	7	0¼	21	5½	7	4¼	22	6⅛
6	4⅜	19	4⅞	6	8⅜	20	5⅜	7	0⅜	21	6	7	4⅜	22	6½
6	4½	19	5¼	6	8½	20	5⅞	7	0½	21	6⅜	7	4½	22	7
6	4⅝	19	5⅝	6	8⅝	20	6¼	7	0⅝	21	6¾	7	4⅝	22	7⅜
6	4¾	19	6	6	8¾	20	6⅝	7	0¾	21	7⅛	7	4¾	22	7¾
6	4⅞	19	6⅜	6	8⅞	20	7	7	0⅞	21	7⅝	7	4⅞	22	8⅛

For Angle Iron measuring $1\frac{1}{8}$ Inch thick, diagonally across the root.

FLANGE INSIDE.

Outside Diameter of Ring.		Length Required for Ring.		Outside Diameter of Ring.		Length Required for Ring.		Outside Diameter of Ring.		Length Required for Ring.		Outside Diameter of Ring.		Length Required for Ring.	
Ft.	In.	Ft.	In.	Ft.	In.	Ft.	In.	Ft.	In	Ft.	In.	Ft.	In.	Ft.	In
7	5	22	$8\frac{1}{2}$	7	9	23	$9\frac{1}{8}$	8	1	24	$9\frac{5}{8}$	8	5	25	$10\frac{1}{4}$
7	$5\frac{1}{8}$	22	$8\frac{7}{8}$	7	$9\frac{1}{8}$	23	$9\frac{1}{2}$	8	$1\frac{1}{8}$	24	10	8	$5\frac{1}{8}$	25	$10\frac{5}{8}$
7	$5\frac{1}{4}$	22	$9\frac{1}{4}$	7	$9\frac{1}{4}$	23	$9\frac{7}{8}$	8	$1\frac{1}{4}$	24	$10\frac{1}{2}$	8	$5\frac{1}{4}$	25	11
7	$5\frac{3}{8}$	22	$9\frac{3}{4}$	7	$9\frac{3}{8}$	23	$10\frac{1}{4}$	8	$1\frac{3}{8}$	24	$10\frac{7}{8}$	8	$5\frac{3}{8}$	25	$11\frac{3}{8}$
7	$5\frac{1}{2}$	22	$10\frac{1}{8}$	7	$9\frac{1}{2}$	23	$10\frac{5}{8}$	8	$1\frac{1}{2}$	24	$11\frac{1}{4}$	8	$5\frac{1}{2}$	25	$11\frac{3}{4}$
7	$5\frac{5}{8}$	22	$10\frac{1}{2}$	7	$9\frac{5}{8}$	23	11	8	$1\frac{5}{8}$	24	$11\frac{5}{8}$	8	$5\frac{5}{8}$	26	$0\frac{1}{8}$
7	$5\frac{3}{4}$	22	$10\frac{7}{8}$	7	$9\frac{3}{4}$	23	$11\frac{1}{2}$	8	$1\frac{3}{4}$	25	0	8	$5\frac{3}{4}$	26	$0\frac{5}{8}$
7	$5\frac{7}{8}$	22	$11\frac{1}{4}$	7	$9\frac{7}{8}$	23	$11\frac{7}{8}$	8	$1\frac{7}{8}$	25	$0\frac{3}{8}$	8	$5\frac{7}{8}$	26	1
7	6	22	$11\frac{5}{8}$	7	10	24	$0\frac{1}{4}$	8	2	25	$0\frac{3}{4}$	8	6	26	$1\frac{3}{8}$
7	$6\frac{1}{8}$	23	0	7	$10\frac{1}{8}$	24	$0\frac{5}{8}$	8	$2\frac{1}{8}$	25	$1\frac{1}{4}$	8	$6\frac{1}{8}$	26	$1\frac{3}{4}$
7	$6\frac{1}{4}$	23	$0\frac{1}{2}$	7	$10\frac{1}{4}$	24	1	8	$2\frac{1}{4}$	25	$1\frac{5}{8}$	8	$6\frac{1}{4}$	26	$2\frac{1}{8}$
7	$6\frac{3}{8}$	23	$0\frac{7}{8}$	7	$10\frac{3}{8}$	24	$1\frac{3}{8}$	8	$2\frac{3}{8}$	25	2	8	$6\frac{3}{8}$	26	$2\frac{1}{2}$
7	$6\frac{1}{2}$	23	$1\frac{1}{4}$	7	$10\frac{1}{2}$	24	$1\frac{3}{4}$	8	$2\frac{1}{2}$	25	$2\frac{3}{8}$	8	$6\frac{1}{2}$	26	$2\frac{7}{8}$
7	$6\frac{5}{8}$	23	$1\frac{5}{8}$	7	$10\frac{5}{8}$	24	$2\frac{1}{4}$	8	$2\frac{5}{8}$	25	$2\frac{3}{4}$	8	$6\frac{5}{8}$	26	$3\frac{3}{8}$
7	$6\frac{3}{4}$	23	2	7	$10\frac{3}{4}$	24	$2\frac{5}{8}$	8	$2\frac{3}{4}$	25	$3\frac{1}{8}$	8	$6\frac{3}{4}$	26	$3\frac{3}{4}$
7	$6\frac{7}{8}$	23	$2\frac{3}{8}$	7	$10\frac{7}{8}$	24	3	8	$2\frac{7}{8}$	25	$3\frac{1}{2}$	8	$6\frac{7}{8}$	26	$4\frac{1}{8}$
7	7	23	$2\frac{3}{4}$	7	11	24	$3\frac{3}{8}$	8	3	25	$3\frac{7}{8}$	8	7	26	$4\frac{1}{2}$
7	$7\frac{1}{8}$	23	$3\frac{1}{4}$	7	$11\frac{1}{8}$	24	$3\frac{3}{4}$	8	$3\frac{1}{8}$	25	$4\frac{3}{8}$	8	$7\frac{1}{8}$	26	$4\frac{7}{8}$
7	$7\frac{1}{4}$	23	$3\frac{5}{8}$	7	$11\frac{1}{4}$	24	$4\frac{1}{8}$	8	$3\frac{1}{4}$	25	$4\frac{3}{4}$	8	$7\frac{1}{4}$	26	$5\frac{1}{4}$
7	$7\frac{3}{8}$	23	4	7	$11\frac{3}{8}$	24	$4\frac{1}{2}$	8	$3\frac{3}{8}$	25	$5\frac{1}{8}$	8	$7\frac{3}{8}$	26	$5\frac{5}{8}$
7	$7\frac{1}{2}$	23	$4\frac{3}{8}$	7	$11\frac{1}{2}$	24	$4\frac{7}{8}$	8	$3\frac{1}{2}$	25	$5\frac{1}{2}$	8	$7\frac{1}{2}$	26	6
7	$7\frac{5}{8}$	23	$4\frac{3}{4}$	7	$11\frac{5}{8}$	24	$5\frac{3}{8}$	8	$3\frac{5}{8}$	25	$5\frac{7}{8}$	8	$7\frac{5}{8}$	26	$6\frac{1}{2}$
7	$7\frac{3}{4}$	23	$5\frac{1}{8}$	7	$11\frac{3}{4}$	24	$5\frac{3}{4}$	8	$3\frac{3}{4}$	25	$6\frac{1}{4}$	8	$7\frac{3}{4}$	26	$6\frac{7}{8}$
7	$7\frac{7}{8}$	23	$5\frac{1}{2}$	7	$11\frac{7}{8}$	24	$6\frac{1}{8}$	8	$3\frac{7}{8}$	25	$6\frac{5}{8}$	8	$7\frac{7}{8}$	26	$7\frac{1}{4}$
7	8	23	6	8	0	24	$6\frac{1}{2}$	8	4	25	7	8	8	26	$7\frac{5}{8}$
7	$8\frac{1}{8}$	23	$6\frac{3}{8}$	8	$0\frac{1}{8}$	24	$6\frac{7}{8}$	8	$4\frac{1}{8}$	25	$7\frac{1}{2}$	8	$8\frac{1}{8}$	26	8
7	$8\frac{1}{4}$	23	$6\frac{3}{4}$	8	$0\frac{1}{4}$	24	$7\frac{1}{4}$	8	$4\frac{1}{4}$	25	$7\frac{7}{8}$	8	$8\frac{1}{4}$	26	$8\frac{3}{8}$
7	$8\frac{3}{8}$	23	$7\frac{1}{8}$	8	$0\frac{3}{8}$	24	$7\frac{5}{8}$	8	$4\frac{3}{8}$	25	$8\frac{1}{4}$	8	$8\frac{3}{8}$	26	$8\frac{7}{8}$
7	$8\frac{1}{2}$	23	$7\frac{1}{2}$	8	$0\frac{1}{2}$	24	8	8	$4\frac{1}{2}$	25	$8\frac{5}{8}$	8	$8\frac{1}{2}$	26	$9\frac{1}{4}$
7	$8\frac{5}{8}$	23	$7\frac{7}{8}$	8	$0\frac{5}{8}$	24	$8\frac{1}{2}$	8	$4\frac{5}{8}$	25	9	8	$8\frac{5}{8}$	26	$9\frac{5}{8}$
7	$8\frac{3}{4}$	23	$8\frac{1}{4}$	8	$0\frac{3}{4}$	24	$8\frac{7}{8}$	8	$4\frac{3}{4}$	25	$9\frac{1}{2}$	8	$8\frac{3}{4}$	26	10
7	$8\frac{7}{8}$	23	$8\frac{3}{4}$	8	$0\frac{7}{8}$	24	$9\frac{1}{4}$	8	$4\frac{7}{8}$	25	$9\frac{7}{8}$	8	$8\frac{7}{8}$	26	$10\frac{3}{8}$

TABLE XVIII.

For Angle Iron measuring $1\frac{1}{4}$ Inch thick. diagonally across the root.

FLANGE INSIDE.

OUTSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.		OUTSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.		OUTSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.		OUTSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.	
FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN	FT.	IN.	FT.	IN.	FT.	IN.
0	9	1	$8\frac{3}{8}$	1	1	2	9	1	5	3	$9\frac{1}{2}$	1	9	4	$10\frac{1}{8}$
0	$9\frac{1}{8}$	1	$8\frac{3}{4}$	1	$1\frac{1}{8}$	2	$9\frac{3}{8}$	1	$5\frac{1}{8}$	3	$9\frac{7}{8}$	1	$9\frac{1}{8}$	4	$10\frac{1}{2}$
0	$9\frac{1}{4}$	1	$9\frac{1}{8}$	1	$1\frac{1}{4}$	2	$9\frac{3}{4}$	1	$5\frac{1}{4}$	3	$10\frac{3}{8}$	1	$9\frac{1}{4}$	4	$10\frac{7}{8}$
0	$9\frac{3}{8}$	1	$9\frac{1}{2}$	1	$1\frac{3}{8}$	2	$10\frac{1}{8}$	1	$5\frac{3}{8}$	3	$10\frac{3}{4}$	1	$9\frac{3}{8}$	4	$11\frac{1}{4}$
0	$9\frac{1}{2}$	1	10	1	$1\frac{1}{2}$	2	$10\frac{1}{2}$	1	$5\frac{1}{2}$	3	$11\frac{1}{8}$	1	$9\frac{1}{2}$	4	$11\frac{5}{8}$
0	$9\frac{5}{8}$	1	$10\frac{3}{8}$	1	$1\frac{5}{8}$	2	$10\frac{7}{8}$	1	$5\frac{5}{8}$	3	$11\frac{1}{2}$	1	$9\frac{5}{8}$	5	0
0	$9\frac{3}{4}$	1	$10\frac{3}{4}$	1	$1\frac{3}{4}$	2	$11\frac{3}{8}$	1	$5\frac{3}{4}$	3	$11\frac{7}{8}$	1	$9\frac{3}{4}$	5	$0\frac{3}{8}$
0	$9\frac{7}{8}$	1	$11\frac{1}{8}$	1	$1\frac{7}{8}$	2	$11\frac{3}{4}$	1	$5\frac{7}{8}$	4	$0\frac{1}{4}$	1	$9\frac{7}{8}$	5	$0\frac{7}{8}$
0	10	1	$11\frac{1}{2}$	1	2	3	$0\frac{1}{8}$	1	6	4	$0\frac{5}{8}$	1	10	5	$1\frac{1}{4}$
0	$10\frac{1}{8}$	1	$11\frac{7}{8}$	1	$2\frac{1}{8}$	3	$0\frac{1}{2}$	1	$6\frac{1}{8}$	4	1	1	$10\frac{1}{8}$	5	$1\frac{1}{2}$
0	$10\frac{1}{4}$	2	$0\frac{3}{8}$	1	$2\frac{1}{4}$	3	$0\frac{7}{8}$	1	$6\frac{1}{4}$	4	$1\frac{3}{8}$	1	$10\frac{1}{4}$	5	2
0	$10\frac{3}{8}$	2	$0\frac{3}{4}$	1	$2\frac{3}{8}$	3	$1\frac{1}{4}$	1	$6\frac{3}{8}$	4	$1\frac{7}{8}$	1	$10\frac{3}{8}$	5	$2\frac{3}{8}$
0	$10\frac{1}{2}$	2	$1\frac{1}{8}$	1	$2\frac{1}{2}$	3	$1\frac{5}{8}$	1	$6\frac{1}{2}$	4	$2\frac{1}{4}$	1	$10\frac{1}{2}$	5	$2\frac{3}{4}$
0	$10\frac{5}{8}$	2	$1\frac{1}{2}$	1	$2\frac{5}{8}$	3	2	1	$6\frac{5}{8}$	4	$2\frac{5}{8}$	1	$10\frac{5}{8}$	5	$3\frac{1}{8}$
0	$10\frac{3}{4}$	2	$1\frac{7}{8}$	1	$2\frac{3}{4}$	3	$2\frac{1}{2}$	1	$6\frac{3}{4}$	4	3	1	$10\frac{3}{4}$	5	$3\frac{5}{8}$
0	$10\frac{7}{8}$	2	$2\frac{3}{8}$	1	$2\frac{7}{8}$	3	$2\frac{7}{8}$	1	$6\frac{7}{8}$	4	$3\frac{3}{8}$	1	$10\frac{7}{8}$	5	4
0	11	2	$2\frac{3}{4}$	1	3	3	$3\frac{1}{4}$	1	7	4	$3\frac{3}{4}$	1	11	5	$4\frac{3}{8}$
0	$11\frac{1}{8}$	2	$3\frac{1}{8}$	1	$3\frac{1}{8}$	3	$3\frac{5}{8}$	1	$7\frac{1}{8}$	4	$4\frac{1}{8}$	1	$11\frac{1}{8}$	5	$4\frac{3}{4}$
0	$11\frac{1}{4}$	2	$3\frac{1}{2}$	1	$3\frac{1}{4}$	3	4	1	$7\frac{1}{4}$	4	$4\frac{1}{2}$	1	$11\frac{1}{4}$	5	$5\frac{1}{8}$
0	$11\frac{3}{8}$	2	$3\frac{7}{8}$	1	$3\frac{3}{8}$	3	$4\frac{3}{8}$	1	$7\frac{3}{8}$	4	5	1	$11\frac{3}{8}$	5	$5\frac{1}{2}$
0	$11\frac{1}{2}$	2	$4\frac{1}{4}$	1	$3\frac{1}{2}$	3	$4\frac{7}{8}$	1	$7\frac{1}{2}$	4	$5\frac{3}{8}$	1	$11\frac{1}{2}$	5	$5\frac{7}{8}$
0	$11\frac{5}{8}$	2	$4\frac{5}{8}$	1	$3\frac{5}{8}$	3	$5\frac{1}{4}$	1	$7\frac{5}{8}$	4	$5\frac{3}{4}$	1	$11\frac{5}{8}$	5	$6\frac{3}{8}$
0	$11\frac{3}{4}$	2	5	1	$3\frac{3}{4}$	3	$5\frac{5}{8}$	1	$7\frac{3}{4}$	4	$6\frac{1}{8}$	1	$11\frac{3}{4}$	5	$6\frac{3}{4}$
0	$11\frac{7}{8}$	2	$5\frac{1}{2}$	1	$3\frac{7}{8}$	3	6	1	$7\frac{7}{8}$	4	$6\frac{1}{2}$	1	$11\frac{7}{8}$	5	$7\frac{1}{8}$
1	0	2	$5\frac{7}{8}$	1	4	3	$6\frac{3}{8}$	1	8	4	7	2	0	5	$7\frac{1}{2}$
1	$0\frac{1}{8}$	2	$6\frac{1}{4}$	1	$4\frac{1}{8}$	3	$6\frac{3}{4}$	1	$8\frac{1}{8}$	4	$7\frac{3}{8}$	2	$0\frac{1}{8}$	5	8
1	$0\frac{1}{4}$	2	$6\frac{5}{8}$	1	$4\frac{1}{4}$	3	$7\frac{1}{8}$	1	$8\frac{1}{4}$	4	$7\frac{3}{4}$	2	$0\frac{1}{4}$	5	$8\frac{5}{8}$
1	$0\frac{3}{8}$	2	7	1	$4\frac{3}{8}$	3	$7\frac{5}{8}$	1	$8\frac{3}{8}$	4	$8\frac{1}{8}$	2	$0\frac{3}{8}$	5	$8\frac{3}{4}$
1	$0\frac{1}{2}$	2	$7\frac{3}{8}$	1	$4\frac{1}{2}$	3	8	1	$8\frac{1}{2}$	4	$8\frac{1}{2}$	2	$0\frac{1}{2}$	5	$9\frac{1}{8}$
1	$0\frac{5}{8}$	2	$7\frac{3}{4}$	1	$4\frac{5}{8}$	3	$8\frac{3}{8}$	1	$8\frac{5}{8}$	4	$8\frac{7}{8}$	2	$0\frac{5}{8}$	5	$9\frac{1}{2}$
1	$0\frac{3}{4}$	2	$8\frac{1}{4}$	1	$4\frac{3}{4}$	3	$8\frac{3}{4}$	1	$8\frac{3}{4}$	4	$9\frac{1}{4}$	2	$0\frac{3}{4}$	5	$9\frac{7}{8}$
1	$0\frac{7}{8}$	2	$8\frac{5}{8}$	1	$4\frac{7}{8}$	3	$9\frac{1}{8}$	1	$8\frac{7}{8}$	4	$9\frac{5}{8}$	2	$0\frac{7}{8}$	5	$10\frac{1}{4}$

For Angle Iron measuring $1\frac{1}{4}$ Inch thick, diagonally across the root.

FLANGE INSIDE.

OUTSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.		OUTSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.		OUTSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.		OUTSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.	
FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.
2	1	5	$10\frac{5}{8}$	2	5	6	$11\frac{1}{4}$	2	9	7	$11\frac{3}{4}$	3	1	9	$0\frac{3}{8}$
2	$1\frac{1}{8}$	5	11	2	$5\frac{1}{8}$	6	$11\frac{5}{8}$	2	$9\frac{1}{8}$	8	$0\frac{1}{8}$	3	$1\frac{1}{8}$	9	$0\frac{3}{4}$
2	$1\frac{1}{4}$	5	$11\frac{1}{2}$	2	$5\frac{1}{4}$	7	0	2	$9\frac{1}{4}$	8	$0\frac{1}{2}$	3	$1\frac{1}{4}$	9	$1\frac{1}{8}$
2	$1\frac{3}{8}$	5	$11\frac{7}{8}$	2	$5\frac{3}{8}$	7	$0\frac{3}{8}$	2	$9\frac{3}{8}$	8	1	3	$1\frac{3}{8}$	9	$1\frac{1}{2}$
2	$1\frac{1}{2}$	6	$0\frac{1}{4}$	2	$5\frac{1}{2}$	7	$0\frac{3}{4}$	2	$9\frac{1}{2}$	8	$1\frac{3}{8}$	3	$1\frac{1}{2}$	9	$1\frac{7}{8}$
2	$1\frac{5}{8}$	6	$0\frac{5}{8}$	2	$5\frac{5}{8}$	7	$1\frac{1}{8}$	2	$9\frac{5}{8}$	8	$1\frac{3}{4}$	3	$1\frac{5}{8}$	9	$2\frac{3}{8}$
2	$1\frac{3}{4}$	6	1	2	$5\frac{3}{4}$	7	$1\frac{1}{2}$	2	$9\frac{3}{4}$	8	$2\frac{1}{8}$	3	$1\frac{3}{4}$	9	$2\frac{3}{4}$
2	$1\frac{7}{8}$	6	$1\frac{3}{8}$	2	$5\frac{7}{8}$	7	2	2	$9\frac{7}{8}$	8	$2\frac{1}{2}$	3	$1\frac{7}{8}$	9	$3\frac{1}{8}$
2	2	6	$1\frac{3}{4}$	2	6	7	$2\frac{3}{8}$	2	10	8	$2\frac{7}{8}$	3	2	9	$3\frac{1}{2}$
2	$2\frac{1}{8}$	6	$2\frac{1}{4}$	2	$6\frac{1}{8}$	7	$2\frac{3}{4}$	2	$10\frac{1}{8}$	8	$3\frac{3}{8}$	3	$2\frac{1}{8}$	9	$3\frac{7}{8}$
2	$2\frac{1}{4}$	6	$2\frac{5}{8}$	2	$6\frac{1}{4}$	7	$3\frac{1}{8}$	2	$10\frac{1}{4}$	8	$3\frac{3}{4}$	3	$2\frac{1}{4}$	9	$4\frac{1}{4}$
2	$2\frac{3}{8}$	6	3	2	$6\frac{3}{8}$	7	$3\frac{1}{2}$	2	$10\frac{3}{8}$	8	$4\frac{1}{8}$	3	$2\frac{3}{8}$	9	$4\frac{5}{8}$
2	$2\frac{1}{2}$	6	$3\frac{3}{8}$	2	$6\frac{1}{2}$	7	$3\frac{7}{8}$	2	$10\frac{1}{2}$	8	$4\frac{1}{2}$	3	$2\frac{1}{2}$	9	5
2	$2\frac{5}{8}$	6	$3\frac{3}{4}$	2	$6\frac{5}{8}$	7	$4\frac{3}{8}$	2	$10\frac{5}{8}$	8	$4\frac{7}{8}$	3	$2\frac{5}{8}$	9	$5\frac{1}{2}$
2	$2\frac{3}{4}$	6	$4\frac{1}{8}$	2	$6\frac{3}{4}$	7	$4\frac{3}{4}$	2	$10\frac{3}{4}$	8	$5\frac{1}{4}$	3	$2\frac{3}{4}$	9	$5\frac{7}{8}$
2	$2\frac{7}{8}$	6	$4\frac{1}{2}$	2	$6\frac{7}{8}$	7	$5\frac{1}{8}$	2	$10\frac{7}{8}$	8	$5\frac{5}{8}$	3	$2\frac{7}{8}$	9	$6\frac{1}{4}$
2	3	6	$4\frac{7}{8}$	2	7	7	$5\frac{1}{2}$	2	11	8	6	3	3	9	$6\frac{5}{8}$
2	$3\frac{1}{8}$	6	$5\frac{3}{8}$	2	$7\frac{1}{8}$	7	$5\frac{7}{8}$	2	$11\frac{1}{8}$	8	$6\frac{1}{2}$	3	$3\frac{1}{8}$	9	7
2	$3\frac{1}{4}$	6	$5\frac{3}{4}$	2	$7\frac{1}{4}$	7	$6\frac{1}{4}$	2	$11\frac{1}{4}$	8	$6\frac{7}{8}$	3	$3\frac{1}{4}$	9	$7\frac{3}{8}$
2	$3\frac{3}{8}$	6	$6\frac{1}{8}$	2	$7\frac{3}{8}$	7	$6\frac{5}{8}$	2	$11\frac{3}{8}$	8	$7\frac{1}{4}$	3	$3\frac{3}{8}$	9	$7\frac{7}{8}$
2	$3\frac{1}{2}$	6	$6\frac{1}{2}$	2	$7\frac{1}{2}$	7	7	2	$11\frac{1}{2}$	8	$7\frac{5}{8}$	3	$3\frac{1}{2}$	9	$8\frac{1}{4}$
2	$3\frac{5}{8}$	6	$6\frac{7}{8}$	2	$7\frac{5}{8}$	7	$7\frac{1}{2}$	2	$11\frac{5}{8}$	8	8	3	$3\frac{5}{8}$	9	$8\frac{5}{8}$
2	$3\frac{3}{4}$	6	$7\frac{1}{4}$	2	$7\frac{3}{4}$	7	$7\frac{7}{8}$	2	$11\frac{3}{4}$	8	$8\frac{3}{8}$	3	$3\frac{3}{4}$	9	9
2	$3\frac{7}{8}$	6	$7\frac{5}{8}$	2	$7\frac{7}{8}$	7	$8\frac{1}{4}$	2	$11\frac{7}{8}$	8	$8\frac{7}{8}$	3	$3\frac{7}{8}$	9	$9\frac{3}{8}$
2	4	6	$8\frac{1}{8}$	2	8	7	$8\frac{5}{8}$	3	0	8	$9\frac{1}{4}$	3	4	9	$9\frac{3}{4}$
2	$4\frac{1}{8}$	6	$8\frac{1}{2}$	2	$8\frac{1}{8}$	7	9	3	$0\frac{1}{8}$	8	$9\frac{5}{8}$	3	$4\frac{1}{8}$	9	$10\frac{1}{8}$
2	$4\frac{1}{4}$	6	$8\frac{7}{8}$	2	$8\frac{1}{4}$	7	$9\frac{3}{8}$	3	$0\frac{1}{4}$	8	10	3	$4\frac{1}{4}$	9	$10\frac{1}{2}$
2	$4\frac{3}{8}$	6	$9\frac{1}{4}$	2	$8\frac{3}{8}$	7	$9\frac{3}{4}$	3	$0\frac{3}{8}$	8	$10\frac{3}{8}$	3	$4\frac{3}{8}$	9	$10\frac{7}{8}$
2	$4\frac{1}{2}$	6	$9\frac{5}{8}$	2	$8\frac{1}{2}$	7	$10\frac{1}{4}$	3	$0\frac{1}{2}$	8	$10\frac{3}{4}$	3	$4\frac{1}{2}$	9	$11\frac{3}{8}$
2	$4\frac{5}{8}$	6	10	2	$8\frac{5}{8}$	7	$10\frac{5}{8}$	3	$0\frac{5}{8}$	8	$11\frac{1}{8}$	3	$4\frac{5}{8}$	9	$11\frac{3}{4}$
2	$4\frac{3}{4}$	6	$10\frac{1}{2}$	2	$8\frac{3}{4}$	7	11	3	$0\frac{3}{4}$	8	$11\frac{1}{2}$	3	$4\frac{3}{4}$	10	$0\frac{1}{8}$
2	$4\frac{7}{8}$	6	$10\frac{7}{8}$	2	$8\frac{7}{8}$	7	$11\frac{3}{8}$	3	$0\frac{7}{8}$	9	0	3	$4\frac{7}{8}$	10	$0\frac{1}{2}$

For Angle Iron measuring $1\frac{1}{4}$ Inch thick, diagonally across the root.

FLANGE INSIDE.

OUTSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.		OUTSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.		OUTSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.		OUTSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.	
FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.
3	5	10	$0\frac{7}{8}$	3	9	11	$1\frac{1}{2}$	4	1	12	2	4	5	13	$2\frac{5}{8}$
3	$5\frac{1}{8}$	10	$1\frac{3}{8}$	3	$9\frac{1}{8}$	11	$1\frac{7}{8}$	4	$1\frac{1}{8}$	12	$2\frac{3}{8}$	4	$5\frac{1}{8}$	13	3
3	$5\frac{1}{4}$	10	$1\frac{3}{4}$	3	$9\frac{1}{4}$	11	$2\frac{1}{4}$	4	$1\frac{1}{4}$	12	$2\frac{7}{8}$	4	$5\frac{1}{4}$	13	$3\frac{3}{8}$
3	$5\frac{3}{8}$	10	$2\frac{1}{8}$	3	$9\frac{3}{8}$	11	$2\frac{5}{8}$	4	$1\frac{3}{8}$	12	$3\frac{1}{4}$	4	$5\frac{3}{8}$	13	$3\frac{3}{4}$
3	$5\frac{1}{2}$	10	$2\frac{1}{2}$	3	$9\frac{1}{2}$	11	3	4	$1\frac{1}{2}$	12	$3\frac{5}{8}$	4	$5\frac{1}{2}$	13	$4\frac{1}{4}$
3	$5\frac{5}{8}$	10	$2\frac{7}{8}$	3	$9\frac{5}{8}$	11	$3\frac{1}{2}$	4	$1\frac{5}{8}$	12	4	4	$5\frac{5}{8}$	13	$4\frac{5}{8}$
3	$5\frac{3}{4}$	10	$3\frac{1}{4}$	3	$9\frac{3}{4}$	11	$3\frac{7}{8}$	4	$1\frac{3}{4}$	12	$4\frac{3}{8}$	4	$5\frac{3}{4}$	13	5
3	$5\frac{7}{8}$	10	$3\frac{5}{8}$	3	$9\frac{7}{8}$	11	$4\frac{1}{4}$	4	$1\frac{7}{8}$	12	$4\frac{3}{4}$	4	$5\frac{7}{8}$	13	$5\frac{3}{8}$
3	6	10	4	3	10	11	$4\frac{5}{8}$	4	2	12	$5\frac{1}{4}$	4	6	13	$5\frac{3}{4}$
3	$6\frac{1}{8}$	10	$4\frac{1}{2}$	3	$10\frac{1}{8}$	11	5	4	$2\frac{1}{8}$	12	$5\frac{5}{8}$	4	$6\frac{1}{8}$	13	$6\frac{1}{8}$
3	$6\frac{1}{4}$	10	$4\frac{7}{8}$	3	$10\frac{1}{4}$	11	$5\frac{3}{8}$	4	$2\frac{1}{4}$	12	6	4	$6\frac{1}{4}$	13	$6\frac{1}{2}$
3	$6\frac{3}{8}$	10	$5\frac{1}{4}$	3	$10\frac{3}{8}$	11	$5\frac{7}{8}$	4	$2\frac{3}{8}$	12	$6\frac{3}{8}$	4	$6\frac{3}{8}$	13	7
3	$6\frac{1}{2}$	10	$5\frac{5}{8}$	3	$10\frac{1}{2}$	11	$6\frac{1}{4}$	4	$2\frac{1}{2}$	12	$6\frac{3}{4}$	4	$6\frac{1}{2}$	13	$7\frac{3}{8}$
3	$6\frac{5}{8}$	10	6	3	$10\frac{5}{8}$	11	$6\frac{5}{8}$	4	$2\frac{5}{8}$	12	$7\frac{1}{8}$	4	$6\frac{5}{8}$	13	$7\frac{3}{4}$
3	$6\frac{3}{4}$	10	$6\frac{3}{8}$	3	$10\frac{3}{4}$	11	7	4	$2\frac{3}{4}$	12	$7\frac{1}{2}$	4	$6\frac{3}{4}$	13	$8\frac{1}{8}$
3	$6\frac{7}{8}$	10	$6\frac{7}{8}$	3	$10\frac{7}{8}$	11	$7\frac{3}{8}$	4	$2\frac{7}{8}$	12	$7\frac{7}{8}$	4	$6\frac{7}{8}$	13	$8\frac{1}{2}$
3	7	10	$7\frac{1}{4}$	3	11	11	$7\frac{3}{4}$	4	3	12	$8\frac{3}{8}$	4	7	13	$8\frac{7}{8}$
3	$7\frac{1}{8}$	10	$7\frac{5}{8}$	3	$11\frac{1}{8}$	11	$8\frac{1}{8}$	4	$3\frac{1}{8}$	12	$8\frac{3}{4}$	4	$7\frac{1}{8}$	13	$9\frac{1}{4}$
3	$7\frac{1}{4}$	10	8	3	$11\frac{1}{4}$	11	$8\frac{1}{2}$	4	$3\frac{1}{4}$	12	$9\frac{1}{8}$	4	$7\frac{1}{4}$	13	$9\frac{5}{8}$
3	$7\frac{3}{8}$	10	$8\frac{3}{8}$	3	$11\frac{3}{8}$	11	$8\frac{7}{8}$	4	$3\frac{3}{8}$	12	$9\frac{1}{2}$	4	$7\frac{3}{8}$	13	$10\frac{1}{8}$
3	$7\frac{1}{2}$	10	$8\frac{3}{4}$	3	$11\frac{1}{2}$	11	$9\frac{3}{8}$	4	$3\frac{1}{2}$	12	$9\frac{7}{8}$	4	$7\frac{1}{2}$	13	$10\frac{1}{2}$
3	$7\frac{5}{8}$	10	$9\frac{1}{8}$	3	$11\frac{5}{8}$	11	$9\frac{3}{4}$	4	$3\frac{5}{8}$	12	$10\frac{3}{8}$	4	$7\frac{5}{8}$	13	$10\frac{7}{8}$
3	$7\frac{3}{4}$	10	$9\frac{1}{2}$	3	$11\frac{3}{4}$	11	$10\frac{1}{8}$	4	$3\frac{3}{4}$	12	$10\frac{3}{4}$	4	$7\frac{3}{4}$	13	$11\frac{1}{4}$
3	$7\frac{7}{8}$	10	$9\frac{7}{8}$	3	$11\frac{7}{8}$	11	$10\frac{1}{2}$	4	$3\frac{7}{8}$	12	$11\frac{1}{8}$	4	$7\frac{7}{8}$	13	$11\frac{5}{8}$
3	8	10	$10\frac{3}{8}$	4	0	11	$10\frac{7}{8}$	4	4	12	$11\frac{1}{2}$	4	8	14	0
3	$8\frac{1}{8}$	10	$10\frac{3}{4}$	4	$0\frac{1}{8}$	11	$11\frac{1}{4}$	4	$4\frac{1}{8}$	12	$11\frac{7}{8}$	4	$8\frac{1}{8}$	14	$0\frac{3}{8}$
3	$8\frac{1}{4}$	10	$11\frac{1}{8}$	4	$0\frac{1}{4}$	11	$11\frac{3}{8}$	4	$4\frac{1}{4}$	13	$0\frac{1}{4}$	4	$8\frac{1}{4}$	14	$0\frac{7}{8}$
3	$8\frac{3}{8}$	10	$11\frac{1}{2}$	4	$0\frac{3}{8}$	12	$0\frac{1}{8}$	4	$4\frac{3}{8}$	13	$0\frac{5}{8}$	4	$8\frac{3}{8}$	14	$1\frac{1}{4}$
3	$8\frac{1}{2}$	10	$11\frac{7}{8}$	4	$0\frac{1}{2}$	12	$0\frac{1}{2}$	4	$4\frac{1}{2}$	13	1	4	$8\frac{1}{2}$	14	$1\frac{5}{8}$
3	$8\frac{5}{8}$	11	$0\frac{3}{8}$	4	$0\frac{5}{8}$	12	$0\frac{7}{8}$	4	$4\frac{5}{8}$	13	$1\frac{1}{2}$	4	$8\frac{5}{8}$	14	2
3	$8\frac{3}{4}$	11	$0\frac{3}{4}$	4	$0\frac{3}{4}$	12	$1\frac{1}{4}$	4	$4\frac{3}{4}$	13	$1\frac{7}{8}$	4	$8\frac{3}{4}$	14	$2\frac{3}{8}$
3	$8\frac{7}{8}$	11	$1\frac{1}{8}$	4	$0\frac{7}{8}$	12	$1\frac{5}{8}$	4	$4\frac{7}{8}$	13	$2\frac{1}{4}$	4	$8\frac{7}{8}$	14	$2\frac{3}{4}$

For Angle Iron measuring $1\frac{1}{4}$ Inch thick, diagonally across the root.

FLANGE INSIDE.

Outside Diameter of Ring.		Length required for Ring.		Outside Diameter of Ring.		Length required for Ring.		Outside Diameter of Ring.		Length required for Ring.		Outside Diameter of Ring.		Length required for Ring.	
Ft.	In.	Ft.	In.	Ft.	In.	Ft.	In.	Ft.	In.	Ft.	In.	Ft.	In.	Ft.	In
4	9	14	$3\frac{1}{8}$	5	1	15	$3\frac{3}{4}$	5	5	16	$4\frac{3}{8}$	5	9	17	$4\frac{7}{8}$
4	$9\frac{1}{8}$	14	$3\frac{1}{2}$	5	$1\frac{1}{8}$	15	$4\frac{1}{8}$	5	$5\frac{1}{8}$	16	$4\frac{3}{4}$	5	$9\frac{1}{8}$	17	$5\frac{1}{4}$
4	$9\frac{1}{4}$	14	4	5	$1\frac{1}{4}$	15	$4\frac{1}{2}$	5	$5\frac{1}{4}$	16	$5\frac{1}{8}$	5	$9\frac{1}{4}$	17	$5\frac{5}{8}$
4	$9\frac{3}{8}$	14	$4\frac{3}{8}$	5	$1\frac{3}{8}$	15	$4\frac{7}{8}$	5	$5\frac{3}{8}$	16	$5\frac{1}{2}$	5	$9\frac{3}{8}$	17	6
4	$9\frac{1}{2}$	14	$4\frac{3}{4}$	5	$1\frac{1}{2}$	15	$5\frac{3}{8}$	5	$5\frac{1}{2}$	16	$5\frac{7}{8}$	5	$9\frac{1}{2}$	17	$6\frac{1}{2}$
4	$9\frac{5}{8}$	14	$5\frac{1}{8}$	5	$1\frac{5}{8}$	15	$5\frac{3}{4}$	5	$5\frac{5}{8}$	16	$6\frac{1}{4}$	5	$9\frac{5}{8}$	17	$6\frac{7}{8}$
4	$9\frac{3}{4}$	14	$5\frac{1}{2}$	5	$1\frac{3}{4}$	15	$6\frac{1}{8}$	5	$5\frac{3}{4}$	16	$6\frac{5}{8}$	5	$9\frac{3}{4}$	17	$7\frac{1}{4}$
4	$9\frac{7}{8}$	14	$5\frac{7}{8}$	5	$1\frac{7}{8}$	15	$6\frac{1}{2}$	5	$5\frac{7}{8}$	16	7	5	$9\frac{7}{8}$	17	$7\frac{5}{8}$
4	10	14	$6\frac{3}{8}$	5	2	15	$6\frac{7}{8}$	5	6	16	$7\frac{1}{2}$	5	10	17	8
4	$10\frac{1}{8}$	14	$6\frac{3}{4}$	5	$2\frac{1}{8}$	15	$7\frac{1}{4}$	5	$6\frac{1}{8}$	16	$7\frac{7}{8}$	5	$10\frac{1}{8}$	17	$8\frac{3}{8}$
4	$10\frac{1}{4}$	14	$7\frac{1}{8}$	5	$2\frac{1}{4}$	15	$7\frac{3}{4}$	5	$6\frac{1}{4}$	16	$8\frac{1}{8}$	5	$10\frac{1}{4}$	17	$8\frac{7}{8}$
4	$10\frac{3}{8}$	14	$7\frac{1}{2}$	5	$2\frac{3}{8}$	15	$8\frac{1}{8}$	5	$6\frac{3}{8}$	16	$8\frac{5}{8}$	5	$10\frac{3}{8}$	17	$9\frac{1}{4}$
4	$10\frac{1}{2}$	14	$7\frac{7}{8}$	5	$2\frac{1}{2}$	15	$8\frac{1}{2}$	5	$6\frac{1}{2}$	16	9	5	$10\frac{1}{2}$	17	$9\frac{5}{8}$
4	$10\frac{5}{8}$	14	$8\frac{1}{4}$	5	$2\frac{5}{8}$	15	$8\frac{7}{8}$	5	$6\frac{5}{8}$	16	$9\frac{3}{8}$	5	$10\frac{5}{8}$	17	10
4	$10\frac{3}{4}$	14	$8\frac{3}{4}$	5	$2\frac{3}{4}$	15	$9\frac{1}{4}$	5	$6\frac{3}{4}$	16	$9\frac{7}{8}$	5	$10\frac{3}{4}$	17	$10\frac{3}{8}$
4	$10\frac{7}{8}$	14	$9\frac{1}{8}$	5	$2\frac{7}{8}$	15	$9\frac{5}{8}$	5	$6\frac{7}{8}$	16	$10\frac{1}{4}$	5	$10\frac{7}{8}$	17	$10\frac{3}{4}$
4	11	14	$9\frac{1}{2}$	5	3	15	10	5	7	16	$10\frac{5}{8}$	5	11	17	$11\frac{1}{8}$
4	$11\frac{1}{8}$	14	$9\frac{7}{8}$	5	$3\frac{1}{8}$	15	$10\frac{3}{8}$	5	$7\frac{1}{8}$	16	11	5	$11\frac{1}{8}$	17	$11\frac{1}{2}$
4	$11\frac{1}{4}$	14	$10\frac{1}{4}$	5	$3\frac{1}{4}$	15	$10\frac{7}{8}$	5	$7\frac{1}{4}$	16	$11\frac{3}{8}$	5	$11\frac{1}{4}$	18	0
4	$11\frac{3}{8}$	14	$10\frac{5}{8}$	5	$3\frac{3}{8}$	15	$11\frac{1}{4}$	5	$7\frac{3}{8}$	16	$11\frac{3}{4}$	5	$11\frac{3}{8}$	18	$0\frac{3}{8}$
4	$11\frac{1}{2}$	14	11	5	$3\frac{1}{2}$	15	$11\frac{5}{8}$	5	$7\frac{1}{2}$	17	$0\frac{1}{8}$	5	$11\frac{1}{2}$	18	$0\frac{3}{4}$
4	$11\frac{5}{8}$	14	$11\frac{1}{2}$	5	$3\frac{5}{8}$	16	0	5	$7\frac{5}{8}$	17	$0\frac{5}{8}$	5	$11\frac{5}{8}$	18	$1\frac{1}{8}$
4	$11\frac{3}{4}$	14	$11\frac{7}{8}$	5	$3\frac{3}{4}$	16	$0\frac{3}{8}$	5	$7\frac{3}{4}$	17	1	5	$11\frac{3}{4}$	18	$1\frac{1}{2}$
4	$11\frac{7}{8}$	15	$0\frac{1}{4}$	5	$3\frac{7}{8}$	16	$0\frac{3}{4}$	5	$7\frac{7}{8}$	17	$1\frac{3}{8}$	5	$11\frac{7}{8}$	18	$1\frac{7}{8}$
5	0	15	$0\frac{5}{8}$	5	4	16	$1\frac{1}{8}$	5	8	17	$1\frac{3}{4}$	6	0	18	$2\frac{3}{8}$
5	$0\frac{1}{8}$	15	1	5	$4\frac{1}{8}$	16	$1\frac{5}{8}$	5	$8\frac{1}{8}$	17	$2\frac{1}{8}$	6	$0\frac{1}{8}$	18	$2\frac{3}{4}$
5	$0\frac{1}{4}$	15	$1\frac{3}{8}$	5	$4\frac{1}{4}$	16	2	5	$8\frac{1}{4}$	17	$2\frac{1}{2}$	6	$0\frac{1}{4}$	18	$3\frac{1}{8}$
5	$0\frac{3}{8}$	15	$1\frac{7}{8}$	5	$4\frac{3}{8}$	16	$2\frac{3}{8}$	5	$8\frac{3}{8}$	17	$2\frac{7}{8}$	6	$0\frac{3}{8}$	18	$3\frac{1}{2}$
5	$0\frac{1}{2}$	15	$2\frac{1}{4}$	5	$4\frac{1}{2}$	16	$2\frac{3}{4}$	5	$8\frac{1}{2}$	17	$3\frac{3}{8}$	6	$0\frac{1}{2}$	18	$3\frac{7}{8}$
5	$0\frac{5}{8}$	15	$2\frac{5}{8}$	5	$4\frac{5}{8}$	16	$3\frac{1}{8}$	5	$8\frac{5}{8}$	17	$3\frac{3}{4}$	6	$0\frac{5}{8}$	18	$4\frac{1}{4}$
5	$0\frac{3}{4}$	15	3	5	$4\frac{3}{4}$	16	$3\frac{1}{2}$	5	$8\frac{3}{4}$	17	$4\frac{1}{8}$	6	$0\frac{3}{4}$	18	$4\frac{5}{8}$
5	$0\frac{7}{8}$	15	$3\frac{3}{8}$	5	$4\frac{7}{8}$	16	$3\frac{7}{8}$	5	$8\frac{7}{8}$	17	$4\frac{1}{2}$	6	$0\frac{7}{8}$	18	5

For Angle Iron measuring 1¼ Inch thick, diagonally across the root.

FLANGE INSIDE.

Outside Diameter of Ring.		Length Required for Ring.		Outside Diameter of Ring.		Length Required for Ring.		Outside Diameter of Ring.		Length Required for Ring.		Outside Diameter of Ring.		Length Required for Ring.	
Ft.	In.	Ft.	In.	Ft.	In.	Ft.	In.	Ft.	In.	Ft.	In.	Ft.	In.	Ft.	In.
6	1	18	5½	6	5	19	6	6	9	20	6⅝	7	1	21	7⅛
6	1⅛	18	5⅞	6	5⅛	19	6⅜	6	9⅛	20	7	7	1⅛	21	7⅝
6	1¼	18	6¼	6	5¼	19	6⅞	6	9¼	20	7⅜	7	1¼	21	8
6	1⅜	18	6⅝	6	5⅜	19	7¼	6	9⅜	20	7¾	7	1⅜	21	8⅜
6	1½	18	7	6	5½	19	7⅝	6	9½	20	8⅛	7	1½	21	8¾
6	1⅝	18	7⅜	6	5⅝	19	8	6	9⅝	20	8½	7	1⅝	21	9⅛
6	1¾	18	7⅞	6	5¾	19	8⅜	6	9¾	20	9	7	1¾	21	9½
6	1⅞	18	8¼	6	5⅞	19	8¾	6	9⅞	20	9⅜	7	1⅞	21	9⅞
6	2	18	8⅝	6	6	19	9⅛	6	10	20	9¾	7	2	21	10⅜
6	2⅛	18	9	6	6⅛	19	9⅝	6	10⅛	20	10⅛	7	2⅛	21	10¾
6	2¼	18	9⅜	6	6¼	19	10	6	10¼	20	10½	7	2¼	21	11⅛
6	2⅜	18	9¾	6	6⅜	19	10⅜	6	10⅜	20	10⅞	7	2⅜	21	11½
6	2½	18	10⅛	6	6½	19	10¾	6	10½	20	11⅜	7	2½	21	11⅞
6	2⅝	18	10½	6	6⅝	19	11⅛	6	10⅝	20	11¾	7	2⅝	22	0¼
6	2¾	18	11	6	6¾	19	11½	6	10¾	21	0⅛	7	2¾	22	0⅝
6	2⅞	18	11⅜	6	6⅞	19	11⅞	6	10⅞	21	0½	7	2⅞	22	1
6	3	18	11¾	6	7	20	0⅜	6	11	21	0⅞	7	3	22	1½
6	3⅛	19	0⅛	6	7⅛	20	0¾	6	11⅛	21	1¼	7	3⅛	22	1⅞
6	3¼	19	0½	6	7¼	20	1⅛	6	11¼	21	1⅝	7	3¼	22	2¼
6	3⅜	19	0⅞	6	7⅜	20	1½	6	11⅜	21	2	7	3⅜	22	2⅝
6	3½	19	1⅜	6	7½	20	1⅞	6	11½	21	2½	7	3½	22	3
6	3⅝	19	1¾	6	7⅝	20	2¼	6	11⅝	21	2⅞	7	3⅝	22	3⅜
6	3¾	19	2⅛	6	7¾	20	2⅝	6	11¾	21	3¼	7	3¾	22	3⅞
6	3⅞	19	2½	6	7⅞	20	3	6	11⅞	21	3⅝	7	3⅞	22	4¼
6	4	19	2⅞	6	8	20	3½	7	0	21	4	7	4	22	4⅝
6	4⅛	19	3⅛	6	8⅛	20	3⅞	7	0⅛	21	4⅜	7	4⅛	22	5
6	4¼	19	3⅝	6	8¼	20	4¼	7	0¼	21	4¾	7	4¼	22	5⅜
6	4⅜	19	4	6	8⅜	20	4⅝	7	0⅜	21	5⅛	7	4⅜	22	5¾
6	4½	19	4½	6	8½	20	5	7	0½	21	5½	7	4½	22	6⅛
6	4⅝	19	4⅞	6	8⅝	20	5⅜	7	0⅝	21	6	7	4⅝	22	6½
6	4¾	19	5¼	6	8¾	20	5⅞	7	0¾	21	6⅜	7	4¾	22	7
6	4⅞	19	5⅝	6	8⅞	20	6¼	7	0⅞	21	6¾	7	4⅞	22	7⅜

For Angle Iron measuring $1\frac{1}{4}$ Inch thick, diagonally across the root.

FLANGE INSIDE.

OUTSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.		OUTSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.		OUTSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.		OUTSIDE DIAMETER OF RING.		LENGTH REQUIRED FOR RING.	
FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN
7	5	22	$7\frac{3}{4}$	7	9	23	$8\frac{1}{4}$	8	1	24	$8\frac{7}{8}$	8	5	25	$9\frac{1}{2}$
7	$5\frac{1}{8}$	22	$8\frac{1}{8}$	7	$9\frac{1}{8}$	23	$8\frac{3}{4}$	8	$1\frac{1}{8}$	24	$9\frac{1}{4}$	8	$5\frac{1}{8}$	25	$9\frac{7}{8}$
7	$5\frac{1}{4}$	22	$8\frac{1}{2}$	7	$9\frac{1}{4}$	23	$9\frac{1}{8}$	8	$1\frac{1}{4}$	24	$9\frac{5}{8}$	8	$5\frac{1}{4}$	25	$10\frac{1}{4}$
7	$5\frac{3}{8}$	22	$8\frac{7}{8}$	7	$9\frac{3}{8}$	23	$9\frac{1}{2}$	8	$1\frac{3}{8}$	24	10	8	$5\frac{3}{8}$	25	$10\frac{5}{8}$
7	$5\frac{1}{2}$	22	$9\frac{1}{4}$	7	$9\frac{1}{2}$	23	$9\frac{7}{8}$	8	$1\frac{1}{2}$	24	$10\frac{1}{2}$	8	$5\frac{1}{2}$	25	11
7	$5\frac{5}{8}$	22	$9\frac{3}{4}$	7	$9\frac{5}{8}$	23	$10\frac{1}{4}$	8	$1\frac{5}{8}$	24	$10\frac{7}{8}$	8	$5\frac{5}{8}$	25	$11\frac{3}{8}$
7	$5\frac{3}{4}$	22	$10\frac{1}{8}$	7	$9\frac{3}{4}$	23	$10\frac{5}{8}$	8	$1\frac{3}{4}$	24	$11\frac{1}{4}$	8	$5\frac{3}{4}$	25	$11\frac{3}{4}$
7	$5\frac{7}{8}$	22	$10\frac{1}{2}$	7	$9\frac{7}{8}$	23	11	8	$1\frac{7}{8}$	24	$11\frac{5}{8}$	8	$5\frac{7}{8}$	26	$0\frac{1}{8}$
7	6	22	$10\frac{7}{8}$	7	10	23	$11\frac{1}{2}$	8	2	25	0	8	6	26	$0\frac{5}{8}$
7	$6\frac{1}{8}$	22	$11\frac{1}{4}$	7	$10\frac{1}{8}$	23	$11\frac{7}{8}$	8	$2\frac{1}{8}$	25	$0\frac{3}{8}$	8	$6\frac{1}{8}$	26	1
7	$6\frac{1}{4}$	22	$11\frac{5}{8}$	7	$10\frac{1}{4}$	24	$0\frac{1}{4}$	8	$2\frac{1}{4}$	25	$0\frac{3}{4}$	8	$6\frac{1}{4}$	26	$1\frac{3}{8}$
7	$6\frac{3}{8}$	23	0	7	$10\frac{3}{8}$	24	$0\frac{5}{8}$	8	$2\frac{3}{8}$	25	$1\frac{1}{4}$	8	$6\frac{3}{8}$	26	$1\frac{3}{4}$
7	$6\frac{1}{2}$	23	$0\frac{1}{2}$	7	$10\frac{1}{2}$	24	1	8	$2\frac{1}{2}$	25	$1\frac{5}{8}$	8	$6\frac{1}{2}$	26	$2\frac{1}{8}$
7	$6\frac{5}{8}$	23	$0\frac{7}{8}$	7	$10\frac{5}{8}$	24	$1\frac{3}{8}$	8	$2\frac{5}{8}$	25	2	8	$6\frac{5}{8}$	26	$2\frac{1}{2}$
7	$6\frac{3}{4}$	23	$1\frac{1}{4}$	7	$10\frac{3}{4}$	24	$1\frac{3}{4}$	8	$2\frac{3}{4}$	25	$2\frac{3}{8}$	8	$6\frac{3}{4}$	26	$2\frac{7}{8}$
7	$6\frac{7}{8}$	23	$1\frac{5}{8}$	7	$10\frac{7}{8}$	24	$2\frac{1}{4}$	8	$2\frac{7}{8}$	25	$2\frac{3}{4}$	8	$6\frac{7}{8}$	26	$3\frac{3}{8}$
7	7	23	2	7	11	24	$2\frac{5}{8}$	8	3	25	$3\frac{1}{8}$	8	7	26	$3\frac{3}{4}$
7	$7\frac{1}{8}$	23	$2\frac{3}{8}$	7	$11\frac{1}{8}$	24	3	8	$3\frac{1}{8}$	25	$3\frac{1}{2}$	8	$7\frac{1}{8}$	26	$4\frac{1}{8}$
7	$7\frac{1}{4}$	23	$2\frac{3}{4}$	7	$11\frac{1}{4}$	24	$3\frac{3}{8}$	8	$3\frac{1}{4}$	25	$3\frac{7}{8}$	8	$7\frac{1}{4}$	26	$4\frac{1}{2}$
7	$7\frac{3}{8}$	23	$3\frac{1}{4}$	7	$11\frac{3}{8}$	24	$3\frac{3}{4}$	8	$3\frac{3}{8}$	25	$4\frac{3}{8}$	8	$7\frac{3}{8}$	26	$4\frac{7}{8}$
7	$7\frac{1}{2}$	23	$3\frac{5}{8}$	7	$11\frac{1}{2}$	24	$4\frac{1}{8}$	8	$3\frac{1}{2}$	25	$4\frac{3}{4}$	8	$7\frac{1}{2}$	26	$5\frac{1}{4}$
7	$7\frac{5}{8}$	23	4	7	$11\frac{5}{8}$	24	$4\frac{1}{2}$	8	$3\frac{5}{8}$	25	$5\frac{1}{8}$	8	$7\frac{5}{8}$	26	$5\frac{5}{8}$
7	$7\frac{3}{4}$	23	$4\frac{3}{8}$	7	$11\frac{3}{4}$	24	$4\frac{7}{8}$	8	$3\frac{3}{4}$	25	$5\frac{1}{2}$	8	$7\frac{3}{4}$	26	6
7	$7\frac{7}{8}$	23	$4\frac{3}{4}$	7	$11\frac{7}{8}$	24	$5\frac{3}{8}$	8	$3\frac{7}{8}$	25	$5\frac{7}{8}$	8	$7\frac{7}{8}$	26	$6\frac{1}{2}$
7	8	23	$5\frac{1}{8}$	8	0	24	$5\frac{3}{4}$	8	4	25	$6\frac{1}{4}$	8	8	26	$6\frac{7}{8}$
7	$8\frac{1}{8}$	23	$5\frac{1}{2}$	8	$0\frac{1}{8}$	24	$6\frac{1}{8}$	8	$4\frac{1}{8}$	25	$6\frac{5}{8}$	8	$8\frac{1}{8}$	26	$7\frac{1}{4}$
7	$8\frac{1}{4}$	23	6	8	$0\frac{1}{4}$	24	$6\frac{1}{2}$	8	$4\frac{1}{4}$	25	7	8	$8\frac{1}{4}$	26	$7\frac{5}{8}$
7	$8\frac{3}{8}$	23	$6\frac{3}{8}$	8	$0\frac{3}{8}$	24	$6\frac{7}{8}$	8	$4\frac{3}{8}$	25	$7\frac{1}{2}$	8	$8\frac{3}{8}$	26	8
7	$8\frac{1}{2}$	23	$6\frac{3}{4}$	8	$0\frac{1}{2}$	24	$7\frac{1}{4}$	8	$4\frac{1}{2}$	25	$7\frac{7}{8}$	8	$8\frac{1}{2}$	26	$8\frac{3}{8}$
7	$8\frac{5}{8}$	23	$7\frac{1}{8}$	8	$0\frac{5}{8}$	24	$7\frac{5}{8}$	8	$4\frac{5}{8}$	25	$8\frac{1}{4}$	8	$8\frac{5}{8}$	26	$8\frac{7}{8}$
7	$8\frac{3}{4}$	23	$7\frac{1}{2}$	8	$0\frac{3}{4}$	24	8	8	$4\frac{3}{4}$	25	$8\frac{5}{8}$	8	$8\frac{3}{4}$	26	$9\frac{1}{4}$
7	$8\frac{7}{8}$	23	$7\frac{7}{8}$	8	$0\frac{7}{8}$	24	$8\frac{1}{2}$	8	$4\frac{7}{8}$	25	9	8	$8\frac{7}{8}$	26	$9\frac{5}{8}$

THE BOILER-MAKERS'

AND

IRON SHIP-BUILDERS' COMPANION.

SECTION III.

Tables for the formation of Circular and Oval Pipes.

FIG. 1.

Figure 1 represents the end of a pipe whose inside diameter is 12 inches, and made of iron plates $\frac{1}{8}$ of an inch thick. In table 21, page 119, in the column of lengths opposite the given diameter, is 3 feet 2 inches, the length required between centre of rivet holes.

NOTE.—The lengths given in the tables for pipe making, are calculated from the centre of the rivet holes, the overlap on the outside of the pipe forms no part of the measurement.

EXAMPLE.—What length is required to make a pipe, the diameter being 1 foot 6 inches, of iron plates, measuring $\frac{1}{16}$ of an inch thick? In table 20, page 118, in the column of lengths opposite the given diameter, is 4 feet $8\frac{11}{16}$ inches, the length required between centre of rivet holes.

What length is required for a circular fire box for a small steam engine boiler, whose inside diameter is 2 feet $2\frac{1}{2}$ inches, to be made from iron plates $\frac{3}{8}$ of an inch thick? In table 25, page 128, in the column of lengths opposite the given diameter, is 7 feet $0\frac{3}{8}$ inch, the length required between centre of rivet holes.

RULE.—Take half the sum of the axis for the diameter.

EXAMPLE.—Suppose an oval pipe is required, whose axis are 1 foot 6 inches, and 1 foot $1\frac{1}{2}$ inches, to be made of iron plates $\frac{3}{16}$ of an inch thick; what length is required between centre of rivet holes?

1 foot 6 inches.
1 ,, $1\frac{1}{2}$,,

2 | 2 ,, $7\frac{1}{2}$,,

1 ,, $3\frac{3}{4}$,, the diameter required.

In table 22, page 121, opposite 1 foot $3\frac{3}{4}$ inches, is 4 ft. $2\frac{1}{16}$ in., the length required between centre of rivet holes.

TABLE XIX.

FOR PIPE MAKING.—Thickness of Plate $\frac{1}{32}$ of an Inch.

Inside Diameter of Pipe.		Length Between Centres of Rivet Holes.		Inside Diameter of Pipe.		Length Between Centres of Rivet Holes.		Inside Diameter of Pipe.		Length Between Centres of Rivet Holes.		Inside Diameter of Pipe.		Length Between Centres of Rivet Holes.	
FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN	FT.	IN.	FT.	IN.	FT.	IN
0	1	0	$3\frac{7}{32}$	0	5	1	$3\frac{25}{32}$	0	9	2	$4\frac{11}{32}$	1	1	3	$4\frac{30}{32}$
0	$1\frac{1}{8}$	0	$3\frac{29}{32}$	0	$5\frac{1}{8}$	1	$4\frac{6}{32}$	0	$9\frac{1}{8}$	2	$4\frac{24}{32}$	1	$1\frac{1}{8}$	3	$5\frac{10}{32}$
0	$1\frac{1}{4}$	0	4	0	$5\frac{1}{4}$	1	$4\frac{18}{32}$	0	$9\frac{1}{4}$	2	$5\frac{5}{32}$	1	$1\frac{1}{4}$	3	$5\frac{23}{32}$
0	$1\frac{3}{8}$	0	$4\frac{13}{32}$	0	$5\frac{3}{8}$	1	$4\frac{31}{32}$	0	$9\frac{3}{8}$	2	$5\frac{17}{32}$	1	$1\frac{3}{8}$	3	$6\frac{3}{32}$
0	$1\frac{1}{2}$	0	$4\frac{25}{32}$	0	$5\frac{1}{2}$	1	$5\frac{12}{32}$	0	$9\frac{1}{2}$	2	$5\frac{30}{32}$	1	$1\frac{1}{2}$	3	$6\frac{10}{32}$
0	$1\frac{5}{8}$	0	$5\frac{6}{32}$	0	$5\frac{5}{8}$	1	$5\frac{24}{32}$	0	$9\frac{5}{8}$	2	$6\frac{12}{32}$	1	$1\frac{5}{8}$	3	$6\frac{28}{32}$
0	$1\frac{3}{4}$	0	$5\frac{12}{32}$	0	$5\frac{3}{4}$	1	$6\frac{5}{32}$	0	$9\frac{3}{4}$	2	$6\frac{23}{32}$	1	$1\frac{3}{4}$	3	$7\frac{9}{32}$
0	$1\frac{7}{8}$	0	$5\frac{31}{32}$	0	$5\frac{7}{8}$	1	$6\frac{17}{32}$	0	$9\frac{7}{8}$	2	$7\frac{3}{32}$	1	$1\frac{7}{8}$	3	$7\frac{22}{32}$
0	2	0	$6\frac{23}{32}$	0	6	1	$6\frac{30}{32}$	0	10	2	$7\frac{16}{32}$	1	2	3	$8\frac{2}{32}$
0	$2\frac{1}{8}$	0	$6\frac{24}{32}$	0	$6\frac{1}{8}$	1	$7\frac{10}{32}$	0	$10\frac{1}{8}$	2	$7\frac{29}{32}$	1	$2\frac{1}{8}$	3	$8\frac{15}{32}$
0	$2\frac{1}{4}$	0	$7\frac{5}{32}$	0	$6\frac{1}{4}$	1	$7\frac{23}{32}$	0	$10\frac{1}{4}$	2	$8\frac{9}{32}$	1	$2\frac{1}{4}$	3	$8\frac{27}{32}$
0	$2\frac{3}{8}$	0	$7\frac{17}{32}$	0	$6\frac{3}{8}$	1	$8\frac{4}{32}$	0	$10\frac{3}{8}$	2	$8\frac{21}{32}$	1	$2\frac{3}{8}$	3	$9\frac{8}{32}$
0	$2\frac{1}{2}$	0	$7\frac{30}{32}$	0	$6\frac{1}{2}$	1	$8\frac{16}{32}$	0	$10\frac{1}{2}$	2	$9\frac{2}{32}$	1	$2\frac{1}{2}$	3	$9\frac{20}{32}$
0	$2\frac{5}{8}$	0	$8\frac{11}{32}$	0	$6\frac{5}{8}$	1	$8\frac{29}{32}$	0	$10\frac{5}{8}$	2	$9\frac{15}{32}$	1	$2\frac{5}{8}$	3	$10\frac{1}{32}$
0	$2\frac{3}{4}$	0	$8\frac{23}{32}$	0	$6\frac{3}{4}$	1	$9\frac{9}{32}$	0	$10\frac{3}{4}$	2	$9\frac{27}{32}$	1	$2\frac{3}{4}$	3	$10\frac{13}{32}$
0	$2\frac{7}{8}$	0	$9\frac{4}{32}$	0	$6\frac{7}{8}$	1	$9\frac{23}{32}$	0	$10\frac{7}{8}$	2	$10\frac{8}{32}$	1	$2\frac{7}{8}$	3	$10\frac{26}{32}$
0	3	0	$9\frac{16}{32}$	0	7	1	$10\frac{2}{32}$	0	11	2	$10\frac{20}{32}$	1	3	3	$11\frac{7}{32}$
0	$3\frac{1}{8}$	0	$9\frac{29}{32}$	0	$7\frac{1}{8}$	1	$10\frac{15}{32}$	0	$11\frac{1}{8}$	2	$11\frac{1}{32}$	1	$3\frac{1}{8}$	3	$11\frac{19}{32}$
0	$3\frac{1}{4}$	0	$10\frac{9}{32}$	0	$7\frac{1}{4}$	1	$10\frac{27}{32}$	0	$11\frac{1}{4}$	2	$11\frac{14}{32}$	1	$3\frac{1}{4}$	4	0
0	$3\frac{3}{8}$	0	$10\frac{22}{32}$	0	$7\frac{3}{8}$	1	$11\frac{8}{32}$	0	$11\frac{3}{8}$	2	$11\frac{26}{32}$	1	$3\frac{3}{4}$	4	$0\frac{12}{32}$
0	$3\frac{1}{2}$	0	$11\frac{2}{32}$	0	$7\frac{1}{2}$	1	$11\frac{21}{32}$	0	$11\frac{1}{2}$	3	$0\frac{7}{16}$	1	$3\frac{1}{2}$	4	$0\frac{25}{32}$
0	$3\frac{5}{8}$	0	$11\frac{15}{32}$	0	$7\frac{5}{8}$	2	$0\frac{1}{32}$	0	$11\frac{5}{8}$	3	$0\frac{19}{32}$	1	$3\frac{5}{8}$	4	$1\frac{5}{32}$
0	$3\frac{3}{4}$	0	$11\frac{28}{32}$	0	$7\frac{3}{4}$	2	$0\frac{14}{32}$	0	$11\frac{3}{4}$	3	1	1	$3\frac{3}{4}$	4	$1\frac{18}{32}$
0	$3\frac{7}{8}$	1	$0\frac{8}{32}$	0	$7\frac{7}{8}$	2	$0\frac{26}{32}$	0	$11\frac{7}{8}$	3	$1\frac{12}{32}$	1	$3\frac{7}{8}$	4	$1\frac{31}{32}$
0	4	1	$0\frac{21}{32}$	0	8	2	$1\frac{7}{32}$	1	0	3	$1\frac{25}{32}$	1	4	4	$2\frac{11}{32}$
0	$4\frac{1}{8}$	1	$1\frac{1}{32}$	0	$8\frac{1}{8}$	2	$1\frac{19}{32}$	1	$0\frac{1}{8}$	3	$2\frac{6}{32}$	1	$4\frac{1}{8}$	4	$2\frac{24}{32}$
0	$4\frac{1}{4}$	1	$1\frac{14}{32}$	0	$8\frac{1}{4}$	2	2	1	$0\frac{1}{4}$	3	$2\frac{18}{32}$	1	$4\frac{1}{4}$	4	$3\frac{5}{32}$
0	$4\frac{3}{8}$	1	$1\frac{26}{32}$	0	$8\frac{3}{8}$	2	$2\frac{13}{32}$	1	$0\frac{3}{8}$	3	$2\frac{31}{32}$	1	$4\frac{3}{8}$	4	$3\frac{17}{32}$
0	$4\frac{1}{2}$	1	$2\frac{7}{32}$	0	$8\frac{1}{2}$	2	$2\frac{25}{32}$	1	$0\frac{1}{2}$	3	$3\frac{11}{32}$	1	$4\frac{1}{2}$	4	$3\frac{29}{32}$
0	$4\frac{5}{8}$	1	$2\frac{29}{32}$	0	$8\frac{5}{8}$	2	$3\frac{6}{32}$	1	$0\frac{5}{8}$	3	$3\frac{24}{32}$	1	$4\frac{5}{8}$	4	$4\frac{10}{32}$
0	$4\frac{3}{4}$	1	3	0	$8\frac{3}{4}$	2	$3\frac{18}{32}$	1	$0\frac{3}{4}$	3	$4\frac{4}{32}$	1	$4\frac{3}{4}$	4	$4\frac{23}{32}$
0	$4\frac{7}{8}$	1	$3\frac{13}{32}$	0	$8\frac{7}{8}$	2	$3\frac{31}{32}$	1	$0\frac{7}{8}$	3	$4\frac{17}{32}$	1	$4\frac{7}{8}$	4	$5\frac{3}{32}$

FOR PIPE MAKING.—Thickness of Plate $\frac{1}{32}$ of an Inch.

Inside Diameter of Pipe.		Length Between Centres of Rivet Holes.		Inside Diameter of Pipe.		Length Between Centres of Rivet Holes.		Inside Diameter of Pipe.		Length Between Centres of Rivet Holes.		Inside Diameter of Pipe.		Length Between Centres of Rivet Holes.	
FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN	FT.	IN.	FT.	IN.	FT.	IN.
1	5	4	$5\frac{16}{32}$	1	9	5	$6\frac{2}{32}$	2	1	6	$6\frac{20}{32}$	2	5	7	$7\frac{6}{32}$
1	$5\frac{1}{8}$	4	$5\frac{28}{32}$	1	$9\frac{1}{8}$	5	$6\frac{14}{32}$	2	$1\frac{1}{8}$	6	7	2	$5\frac{1}{8}$	7	$7\frac{19}{32}$
1	$5\frac{1}{4}$	4	$6\frac{9}{32}$	1	$9\frac{1}{4}$	5	$6\frac{27}{32}$	2	$1\frac{1}{4}$	6	$7\frac{13}{32}$	2	$5\frac{1}{4}$	7	$7\frac{31}{32}$
1	$5\frac{3}{8}$	4	$6\frac{31}{32}$	1	$9\frac{3}{8}$	5	$7\frac{7}{32}$	2	$1\frac{3}{8}$	6	$7\frac{26}{32}$	2	$5\frac{3}{8}$	7	$8\frac{12}{32}$
1	$5\frac{1}{2}$	4	$7\frac{2}{32}$	1	$9\frac{1}{2}$	5	$7\frac{20}{32}$	2	$1\frac{1}{2}$	6	$8\frac{6}{32}$	2	$5\frac{1}{2}$	7	$8\frac{24}{32}$
1	$5\frac{5}{8}$	4	$7\frac{15}{32}$	1	$9\frac{5}{8}$	5	$8\frac{1}{32}$	2	$1\frac{5}{8}$	6	$8\frac{19}{32}$	2	$5\frac{5}{8}$	7	$9\frac{5}{32}$
1	$5\frac{3}{4}$	4	$7\frac{27}{32}$	1	$9\frac{3}{4}$	5	$8\frac{13}{32}$	2	$1\frac{3}{4}$	6	$8\frac{31}{32}$	2	$5\frac{3}{4}$	7	$9\frac{17}{32}$
1	$5\frac{7}{8}$	4	$8\frac{8}{32}$	1	$9\frac{7}{8}$	5	$8\frac{26}{32}$	2	$1\frac{7}{8}$	6	$9\frac{12}{32}$	2	$5\frac{7}{8}$	7	$9\frac{30}{32}$
1	6	4	$8\frac{20}{32}$	1	10	5	$9\frac{6}{32}$	2	2	6	$9\frac{24}{32}$	2	6	7	$10\frac{11}{32}$
1	$6\frac{1}{8}$	4	$9\frac{1}{32}$	1	$10\frac{1}{8}$	5	$9\frac{19}{32}$	2	$2\frac{1}{8}$	6	$10\frac{5}{32}$	2	$6\frac{1}{8}$	7	$10\frac{23}{32}$
1	$6\frac{1}{4}$	4	$9\frac{13}{32}$	1	$10\frac{1}{4}$	5	$9\frac{31}{32}$	2	$2\frac{1}{4}$	6	$10\frac{18}{32}$	2	$6\frac{1}{4}$	7	$11\frac{4}{32}$
1	$6\frac{3}{8}$	4	$9\frac{26}{32}$	1	$10\frac{3}{8}$	5	$10\frac{12}{32}$	2	$2\frac{3}{8}$	6	$10\frac{30}{32}$	2	$6\frac{3}{8}$	7	$11\frac{16}{32}$
1	$6\frac{1}{2}$	4	$10\frac{6}{32}$	1	$10\frac{1}{2}$	5	$10\frac{25}{32}$	2	$2\frac{1}{2}$	6	$11\frac{11}{32}$	2	$6\frac{1}{2}$	7	$11\frac{29}{32}$
1	$6\frac{5}{8}$	4	$10\frac{19}{32}$	1	$10\frac{5}{8}$	5	$11\frac{5}{32}$	2	$2\frac{5}{8}$	6	$11\frac{23}{32}$	2	$6\frac{5}{8}$	8	$0\frac{9}{32}$
1	$6\frac{3}{4}$	4	11	1	$10\frac{3}{4}$	5	$11\frac{18}{32}$	2	$2\frac{3}{4}$	7	$0\frac{4}{32}$	2	$6\frac{3}{4}$	8	$0\frac{22}{32}$
1	$6\frac{7}{8}$	4	$11\frac{12}{32}$	1	$10\frac{7}{8}$	5	$11\frac{30}{32}$	2	$2\frac{7}{8}$	7	$0\frac{18}{32}$	2	$6\frac{7}{8}$	8	$1\frac{3}{32}$
1	7	4	$11\frac{24}{32}$	1	11	6	$0\frac{11}{32}$	2	3	7	$0\frac{29}{32}$	2	7	8	$1\frac{15}{32}$
1	$7\frac{1}{8}$	5	$0\frac{5}{32}$	1	$11\frac{1}{8}$	6	$0\frac{23}{32}$	2	$3\frac{1}{8}$	7	$1\frac{10}{32}$	2	$7\frac{1}{8}$	8	$1\frac{28}{32}$
1	$7\frac{1}{4}$	5	$0\frac{18}{32}$	1	$11\frac{1}{4}$	6	$1\frac{4}{32}$	2	$3\frac{1}{4}$	7	$1\frac{22}{32}$	2	$7\frac{1}{4}$	8	$2\frac{8}{32}$
1	$7\frac{3}{8}$	5	$0\frac{30}{32}$	1	$11\frac{3}{8}$	6	$1\frac{17}{32}$	2	$3\frac{3}{8}$	7	$2\frac{3}{32}$	2	$7\frac{3}{8}$	8	$2\frac{21}{32}$
1	$7\frac{1}{2}$	5	$1\frac{12}{32}$	1	$11\frac{1}{2}$	6	$1\frac{29}{32}$	2	$3\frac{1}{2}$	7	$2\frac{15}{32}$	2	$7\frac{1}{2}$	8	$3\frac{2}{32}$
1	$7\frac{5}{8}$	5	$1\frac{24}{32}$	1	$11\frac{5}{8}$	6	$2\frac{10}{32}$	2	$3\frac{5}{8}$	7	$2\frac{28}{32}$	2	$7\frac{5}{8}$	8	$3\frac{14}{32}$
1	$7\frac{3}{4}$	5	$2\frac{4}{32}$	1	$11\frac{3}{4}$	6	$2\frac{22}{32}$	2	$3\frac{3}{4}$	7	$3\frac{8}{32}$	2	$7\frac{3}{4}$	8	$3\frac{27}{32}$
1	$7\frac{7}{8}$	5	$2\frac{17}{32}$	1	$11\frac{7}{8}$	6	$3\frac{3}{32}$	2	$3\frac{7}{8}$	7	$3\frac{21}{32}$	2	$7\frac{7}{8}$	8	$4\frac{7}{32}$
1	8	5	$2\frac{29}{32}$	2	0	6	$3\frac{15}{32}$	2	4	7	$4\frac{2}{32}$	2	8	8	$4\frac{20}{32}$
1	$8\frac{1}{8}$	5	$3\frac{10}{32}$	2	$0\frac{1}{8}$	6	$3\frac{28}{32}$	2	$4\frac{1}{8}$	7	$4\frac{14}{32}$	2	$8\frac{1}{8}$	8	5
1	$8\frac{1}{4}$	5	$3\frac{22}{32}$	2	$0\frac{1}{4}$	6	$4\frac{9}{32}$	2	$4\frac{1}{4}$	7	$4\frac{27}{32}$	2	$8\frac{1}{4}$	8	$5\frac{13}{32}$
1	$8\frac{3}{8}$	5	$4\frac{3}{32}$	2	$0\frac{3}{8}$	6	$4\frac{21}{32}$	2	$4\frac{3}{8}$	7	$5\frac{7}{32}$	2	$8\frac{3}{8}$	8	$5\frac{25}{32}$
1	$8\frac{1}{2}$	5	$4\frac{16}{32}$	2	$0\frac{1}{2}$	6	$5\frac{2}{32}$	2	$4\frac{1}{2}$	7	$5\frac{20}{32}$	2	$8\frac{1}{2}$	8	$6\frac{6}{32}$
1	$8\frac{5}{8}$	5	$4\frac{28}{32}$	2	$0\frac{5}{8}$	6	$5\frac{14}{32}$	2	$4\frac{5}{8}$	7	6	2	$8\frac{5}{8}$	8	$6\frac{18}{32}$
1	$8\frac{3}{4}$	5	$5\frac{8}{32}$	2	$0\frac{3}{4}$	6	$5\frac{27}{32}$	2	$4\frac{3}{4}$	7	$6\frac{13}{32}$	2	$8\frac{3}{4}$	8	$6\frac{31}{32}$
1	$8\frac{7}{8}$	5	$5\frac{21}{32}$	2	$0\frac{7}{8}$	6	$6\frac{7}{32}$	2	$4\frac{7}{8}$	7	$6\frac{25}{32}$	2	$8\frac{7}{8}$	8	$7\frac{12}{32}$

TABLE XX.

FOR PIPE MAKING.—Thickness of Plate $\frac{1}{16}$ of an Inch.

Inside Diameter of Pipe.		Length Between Centres of Rivet Holes.		Inside Diameter of Pipe.		Length Between Centres of Rivet Holes.		Inside Diameter of Pipe.		Length Between Centres of Rivet Holes.		Inside Diameter of Pipe.		Length Between Centres of Rivet Holes.	
FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN	FT.	IN.	FT.	IN.	FT.	IN.
0	1	0	$3\frac{5}{16}$	0	5	1	$3\frac{7}{8}$	0	9	2	$4\frac{7}{16}$	1	1	3	5
0	$1\frac{1}{8}$	0	$3\frac{11}{16}$	0	$5\frac{1}{8}$	1	$4\frac{1}{4}$	0	$9\frac{1}{8}$	2	$4\frac{13}{16}$	1	$1\frac{1}{8}$	3	$5\frac{3}{8}$
0	$1\frac{1}{4}$	0	$4\frac{1}{8}$	0	$5\frac{1}{4}$	1	$4\frac{11}{16}$	0	$9\frac{1}{4}$	2	$5\frac{1}{4}$	1	$1\frac{1}{4}$	3	$5\frac{13}{16}$
0	$1\frac{3}{8}$	0	$4\frac{1}{2}$	0	$5\frac{3}{8}$	1	$5\frac{1}{16}$	0	$9\frac{3}{8}$	2	$5\frac{5}{8}$	1	$1\frac{3}{8}$	3	$6\frac{3}{16}$
0	$1\frac{1}{2}$	0	$4\frac{7}{8}$	0	$5\frac{1}{2}$	1	$5\frac{7}{16}$	0	$9\frac{1}{2}$	2	6	1	$1\frac{1}{2}$	3	$6\frac{9}{16}$
0	$1\frac{5}{8}$	0	$5\frac{1}{4}$	0	$5\frac{5}{8}$	1	$5\frac{13}{16}$	0	$9\frac{5}{8}$	2	$6\frac{7}{16}$	1	$1\frac{5}{8}$	3	7
0	$1\frac{3}{4}$	0	$5\frac{5}{8}$	0	$5\frac{3}{4}$	1	$6\frac{1}{4}$	0	$9\frac{3}{4}$	2	$6\frac{13}{16}$	1	$1\frac{3}{4}$	3	$7\frac{3}{8}$
0	$1\frac{7}{8}$	0	$6\frac{1}{16}$	0	$5\frac{7}{8}$	1	$6\frac{5}{8}$	0	$9\frac{7}{8}$	2	$7\frac{3}{16}$	1	$1\frac{7}{8}$	3	$7\frac{3}{4}$
0	2	0	$6\frac{7}{16}$	0	6	1	7	0	10	2	$7\frac{9}{16}$	1	2	3	$8\frac{1}{8}$
0	$2\frac{1}{8}$	0	$6\frac{7}{8}$	0	$6\frac{1}{8}$	1	$7\frac{7}{16}$	0	$10\frac{1}{8}$	2	8	1	$2\frac{1}{8}$	3	$8\frac{9}{16}$
0	$2\frac{1}{4}$	0	$7\frac{1}{4}$	0	$6\frac{1}{4}$	1	$7\frac{13}{16}$	0	$10\frac{1}{4}$	2	$8\frac{3}{8}$	1	$2\frac{1}{4}$	3	$8\frac{15}{16}$
0	$2\frac{3}{8}$	0	$7\frac{5}{8}$	0	$6\frac{3}{8}$	1	$8\frac{3}{16}$	0	$10\frac{3}{8}$	2	$8\frac{3}{4}$	1	$2\frac{3}{8}$	3	$9\frac{5}{16}$
0	$2\frac{1}{2}$	0	8	0	$6\frac{1}{2}$	1	$8\frac{9}{16}$	0	$10\frac{1}{2}$	2	$9\frac{3}{16}$	1	$2\frac{1}{2}$	3	$9\frac{11}{16}$
0	$2\frac{5}{8}$	0	$8\frac{7}{16}$	0	$6\frac{5}{8}$	1	9	0	$10\frac{5}{8}$	2	$9\frac{9}{16}$	1	$2\frac{5}{8}$	3	$10\frac{1}{8}$
0	$2\frac{3}{4}$	0	$8\frac{13}{16}$	0	$6\frac{3}{4}$	1	$9\frac{3}{8}$	0	$10\frac{3}{4}$	2	$9\frac{15}{16}$	1	$2\frac{3}{4}$	3	$10\frac{1}{2}$
0	$2\frac{7}{8}$	0	$9\frac{3}{16}$	0	$6\frac{7}{8}$	1	$9\frac{3}{4}$	0	$10\frac{7}{8}$	2	$10\frac{5}{16}$	1	$2\frac{7}{8}$	3	$10\frac{7}{8}$
0	3	0	$9\frac{3}{8}$	0	7	1	$10\frac{3}{16}$	0	11	2	$10\frac{3}{4}$	1	3	3	$11\frac{1}{4}$
0	$3\frac{1}{8}$	0	10	0	$7\frac{1}{8}$	1	$10\frac{9}{16}$	0	$11\frac{1}{8}$	2	$11\frac{1}{8}$	1	$3\frac{1}{8}$	3	$11\frac{11}{16}$
0	$3\frac{1}{4}$	0	$10\frac{3}{8}$	0	$7\frac{1}{4}$	1	$10\frac{15}{16}$	0	$11\frac{1}{4}$	2	$11\frac{1}{2}$	1	$3\frac{1}{4}$	4	$0\frac{1}{16}$
0	$3\frac{3}{8}$	0	$10\frac{3}{4}$	0	$7\frac{3}{8}$	1	$11\frac{5}{16}$	0	$11\frac{3}{8}$	2	$11\frac{7}{8}$	1	$3\frac{3}{8}$	4	$0\frac{7}{16}$
0	$3\frac{1}{2}$	0	$11\frac{3}{16}$	0	$7\frac{1}{2}$	1	$11\frac{3}{4}$	0	$11\frac{1}{2}$	3	$0\frac{5}{16}$	1	$3\frac{1}{2}$	4	$0\frac{7}{8}$
0	$3\frac{5}{8}$	0	$11\frac{9}{16}$	0	$7\frac{5}{8}$	2	$0\frac{1}{8}$	0	$11\frac{5}{8}$	3	$0\frac{11}{16}$	1	$3\frac{5}{8}$	4	$1\frac{1}{4}$
0	$3\frac{3}{4}$	0	$11\frac{15}{16}$	0	$7\frac{3}{4}$	2	$0\frac{1}{2}$	0	$11\frac{3}{4}$	3	$1\frac{1}{16}$	1	$3\frac{3}{4}$	4	$1\frac{5}{8}$
0	$3\frac{7}{8}$	1	$0\frac{3}{8}$	0	$7\frac{7}{8}$	2	$0\frac{15}{16}$	0	$11\frac{7}{8}$	3	$1\frac{1}{2}$	1	$3\frac{7}{8}$	4	$2\frac{1}{16}$
0	4	1	$0\frac{3}{4}$	0	8	2	$1\frac{5}{16}$	1	0	3	$1\frac{7}{8}$	1	4	4	$2\frac{7}{16}$
0	$4\frac{1}{8}$	1	$1\frac{1}{4}$	0	$8\frac{1}{8}$	2	$1\frac{11}{16}$	1	$0\frac{1}{8}$	3	$2\frac{1}{4}$	1	$4\frac{1}{8}$	4	$2\frac{13}{16}$
0	$4\frac{1}{4}$	1	$1\frac{1}{2}$	0	$8\frac{1}{4}$	2	$2\frac{1}{16}$	1	$0\frac{1}{4}$	3	$2\frac{11}{16}$	1	$4\frac{1}{4}$	4	$3\frac{3}{16}$
0	$4\frac{3}{8}$	1	$1\frac{15}{16}$	0	$8\frac{3}{8}$	2	$2\frac{1}{2}$	1	$0\frac{3}{8}$	3	$3\frac{1}{16}$	1	$4\frac{3}{8}$	4	$3\frac{5}{8}$
0	$4\frac{1}{2}$	1	$2\frac{5}{16}$	0	$8\frac{1}{2}$	2	$2\frac{7}{8}$	1	$0\frac{1}{2}$	3	$3\frac{7}{16}$	1	$4\frac{1}{2}$	4	4
0	$4\frac{5}{8}$	1	$2\frac{11}{16}$	0	$8\frac{5}{8}$	2	$3\frac{1}{4}$	1	$0\frac{5}{8}$	3	$3\frac{13}{16}$	1	$4\frac{5}{8}$	4	$4\frac{3}{8}$
0	$4\frac{3}{4}$	1	$3\frac{1}{16}$	0	$8\frac{3}{4}$	2	$3\frac{5}{8}$	1	$0\frac{3}{4}$	3	$4\frac{1}{4}$	1	$4\frac{3}{4}$	4	$4\frac{13}{16}$
0	$4\frac{7}{8}$	1	$3\frac{1}{2}$	0	$8\frac{7}{8}$	2	$4\frac{1}{16}$	1	$0\frac{7}{8}$	3	$4\frac{5}{8}$	1	$4\frac{7}{8}$	4	$5\frac{3}{16}$

FOR PIPE MAKING.—Thickness of Plate $\frac{1}{16}$ of an Inch.

Inside Diameter of Pipe.		Length Between Centres of Rivet Holes.		Inside Diameter of Pipe.		Length Between Centres of Rivet Holes.		Inside Diameter of Pipe.		Length Between Centres of Rivet Holes.		Inside Diameter of Pipe.		Length Between Centres of Rivet Holes.	
FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN	FT.	IN.	FT.	IN.	FT.	IN.
1	5	4	$5\frac{9}{16}$	1	9	5	$6\frac{1}{8}$	2	1	6	$6\frac{11}{16}$	2	5	7	$7\frac{1}{4}$
1	$5\frac{1}{8}$	4	$5\frac{15}{16}$	1	$9\frac{1}{8}$	5	$6\frac{9}{16}$	2	$1\frac{1}{8}$	6	$7\frac{1}{8}$	2	$5\frac{1}{8}$	7	$7\frac{11}{16}$
1	$5\frac{1}{4}$	4	$6\frac{3}{8}$	1	$9\frac{1}{4}$	5	$6\frac{15}{16}$	2	$1\frac{1}{4}$	6	$7\frac{1}{2}$	2	$5\frac{1}{4}$	7	8
1	$5\frac{3}{8}$	4	$6\frac{3}{4}$	1	$9\frac{3}{8}$	5	$7\frac{5}{16}$	2	$1\frac{3}{8}$	6	$7\frac{7}{8}$	2	$5\frac{3}{8}$	7	$8\frac{7}{16}$
1	$5\frac{1}{2}$	4	$7\frac{1}{8}$	1	$9\frac{1}{2}$	5	$7\frac{3}{4}$	2	$1\frac{1}{2}$	6	$8\frac{1}{4}$	2	$5\frac{1}{2}$	7	$8\frac{13}{16}$
1	$5\frac{5}{8}$	4	$7\frac{9}{16}$	1	$9\frac{5}{8}$	5	$8\frac{1}{8}$	2	$1\frac{5}{8}$	6	$8\frac{11}{16}$	2	$5\frac{5}{8}$	7	$9\frac{1}{4}$
1	$5\frac{3}{4}$	4	$7\frac{15}{16}$	1	$9\frac{3}{4}$	5	$8\frac{1}{2}$	2	$1\frac{3}{4}$	6	$9\frac{1}{16}$	2	$5\frac{3}{4}$	7	$9\frac{5}{8}$
1	$5\frac{7}{8}$	4	$8\frac{5}{16}$	1	$9\frac{7}{8}$	5	$8\frac{7}{8}$	2	$1\frac{7}{8}$	6	$9\frac{7}{16}$	2	$5\frac{7}{8}$	7	10
1	6	4	$8\frac{11}{16}$	1	10	5	$9\frac{1}{4}$	2	2	6	$9\frac{7}{8}$	2	6	7	$10\frac{7}{16}$
1	$6\frac{1}{8}$	4	$9\frac{1}{8}$	1	$10\frac{1}{8}$	5	$9\frac{11}{16}$	2	$2\frac{1}{8}$	6	$10\frac{1}{4}$	2	$6\frac{1}{8}$	7	$10\frac{13}{16}$
1	$6\frac{1}{4}$	4	$9\frac{1}{2}$	1	$10\frac{1}{4}$	5	$10\frac{1}{16}$	2	$2\frac{1}{4}$	6	$10\frac{5}{8}$	2	$6\frac{1}{4}$	7	$11\frac{3}{16}$
1	$6\frac{3}{8}$	4	$9\frac{7}{8}$	1	$10\frac{3}{8}$	5	$10\frac{7}{16}$	2	$2\frac{3}{8}$	6	11	2	$6\frac{3}{8}$	7	$11\frac{9}{16}$
1	$6\frac{1}{2}$	4	$10\frac{5}{16}$	1	$10\frac{1}{2}$	5	$10\frac{7}{8}$	2	$2\frac{1}{2}$	6	$11\frac{7}{16}$	2	$6\frac{1}{2}$	8	0
1	$6\frac{5}{8}$	4	$10\frac{11}{16}$	1	$10\frac{5}{8}$	5	$11\frac{1}{4}$	2	$2\frac{5}{8}$	6	$11\frac{13}{16}$	2	$6\frac{5}{8}$	8	$0\frac{3}{8}$
1	$6\frac{3}{4}$	4	$11\frac{1}{16}$	1	$10\frac{3}{4}$	5	$11\frac{5}{8}$	2	$2\frac{3}{4}$	7	$0\frac{3}{16}$	2	$6\frac{3}{4}$	8	$0\frac{3}{4}$
1	$6\frac{7}{8}$	4	$11\frac{7}{16}$	1	$10\frac{7}{8}$	6	0	2	$2\frac{7}{8}$	7	$0\frac{5}{8}$	2	$6\frac{7}{8}$	8	$1\frac{3}{16}$
1	7	4	$11\frac{7}{8}$	1	11	6	$0\frac{7}{16}$	2	3	7	1	2	7	8	$1\frac{9}{16}$
1	$7\frac{1}{8}$	5	$0\frac{1}{4}$	1	$11\frac{1}{8}$	6	$0\frac{13}{16}$	2	$3\frac{1}{8}$	7	$1\frac{3}{8}$	2	$7\frac{1}{8}$	8	$1\frac{15}{16}$
1	$7\frac{1}{4}$	5	$0\frac{5}{8}$	1	$11\frac{1}{4}$	6	$1\frac{3}{16}$	2	$3\frac{1}{4}$	7	$1\frac{3}{4}$	2	$7\frac{1}{4}$	8	$2\frac{5}{16}$
1	$7\frac{3}{8}$	5	$1\frac{1}{16}$	1	$11\frac{3}{8}$	6	$1\frac{5}{8}$	2	$3\frac{3}{8}$	7	$2\frac{3}{16}$	2	$7\frac{3}{8}$	8	$2\frac{3}{4}$
1	$7\frac{1}{2}$	5	$1\frac{7}{16}$	1	$11\frac{1}{2}$	6	2	2	$3\frac{1}{2}$	7	$2\frac{9}{16}$	2	$7\frac{1}{2}$	8	$3\frac{1}{8}$
1	$7\frac{5}{8}$	5	$1\frac{13}{16}$	1	$11\frac{5}{8}$	6	$2\frac{3}{8}$	2	$3\frac{5}{8}$	7	$2\frac{15}{16}$	2	$7\frac{5}{8}$	8	$3\frac{1}{2}$
1	$7\frac{3}{4}$	5	$2\frac{3}{16}$	1	$11\frac{3}{4}$	6	$2\frac{3}{4}$	2	$3\frac{3}{4}$	7	$3\frac{3}{8}$	2	$7\frac{3}{4}$	8	$3\frac{15}{16}$
1	$7\frac{7}{8}$	5	$2\frac{5}{8}$	1	$11\frac{7}{8}$	6	$3\frac{3}{16}$	2	$3\frac{7}{8}$	7	$3\frac{3}{4}$	2	$7\frac{7}{8}$	8	$4\frac{5}{16}$
1	8	5	3	2	0	6	$3\frac{9}{16}$	2	4	7	$4\frac{1}{8}$	2	8	8	$4\frac{11}{16}$
1	$8\frac{1}{8}$	5	$3\frac{3}{8}$	2	$0\frac{1}{8}$	6	$3\frac{15}{16}$	2	$4\frac{1}{8}$	7	$4\frac{1}{2}$	2	$8\frac{1}{8}$	8	$5\frac{1}{16}$
1	$8\frac{1}{4}$	5	$3\frac{13}{16}$	2	$0\frac{1}{4}$	6	$4\frac{3}{8}$	2	$4\frac{1}{4}$	7	$4\frac{15}{16}$	2	$8\frac{1}{4}$	8	$5\frac{1}{2}$
1	$8\frac{3}{8}$	5	$4\frac{3}{16}$	2	$0\frac{3}{8}$	6	$4\frac{3}{4}$	2	$4\frac{3}{8}$	7	$5\frac{5}{16}$	2	$8\frac{3}{8}$	8	$5\frac{7}{8}$
1	$8\frac{1}{2}$	5	$4\frac{9}{16}$	2	$0\frac{1}{2}$	6	$5\frac{1}{8}$	2	$4\frac{1}{2}$	7	$5\frac{11}{16}$	2	$8\frac{1}{2}$	8	$6\frac{1}{4}$
1	$8\frac{5}{8}$	5	$4\frac{15}{16}$	2	$0\frac{5}{8}$	6	$5\frac{1}{2}$	2	$4\frac{5}{8}$	7	$6\frac{1}{16}$	2	$8\frac{5}{8}$	8	$6\frac{11}{16}$
1	$8\frac{3}{4}$	5	$5\frac{3}{8}$	2	$0\frac{3}{4}$	6	$5\frac{15}{16}$	2	$4\frac{3}{4}$	7	$6\frac{1}{2}$	2	$8\frac{3}{4}$	8	$7\frac{1}{16}$
1	$8\frac{7}{8}$	5	$5\frac{3}{4}$	2	$0\frac{7}{8}$	6	$6\frac{5}{16}$	2	$4\frac{7}{8}$	7	$6\frac{7}{8}$	2	$8\frac{7}{8}$	8	$7\frac{7}{16}$

TABLE XXI.

FOR PIPE MAKING.—Thickness of Plate ⅛ of an Inch.

Inside Diameter of Pipe.		Length Between Centres of Rivet Holes.		Inside Diameter of Pipe.		Length Between Centres of Rivet Holes.		Inside Diameter of Pipe.		Length Between Centres of Rivet Holes.		Inside Diameter of Pipe.		Length Between Centres of Rivet Holes.	
FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN	FT.	IN.	FT.	IN.	FT.	IN.
0	1	0	3½	0	5	1	4	0	9	2	4⅝	1	1	3	5¼
0	1⅛	0	3⅞	0	5⅛	1	4½	0	9⅛	2	5	1	1⅛	3	5⅝
0	1¼	0	4¼	0	5¼	1	4⅞	0	9¼	2	5½	1	1¼	3	6
0	1⅜	0	4⅝	0	5⅜	1	5¼	0	9⅜	2	5⅞	1	1⅜	3	6⅜
0	1½	0	5	0	5½	1	5⅝	0	9½	2	6¼	1	1½	3	6¾
0	1⅝	0	5⅜	0	5⅝	1	6	0	9⅝	2	6⅝	1	1⅝	3	7⅛
0	1¾	0	5⅞	0	5¾	1	6½	0	9¾	2	7	1	1¾	3	7⅝
0	1⅞	0	6¼	0	5⅞	1	6⅞	0	9⅞	2	7⅜	1	1⅞	3	8
0	2	0	6⅝	0	6	1	7¼	0	10	2	7¾	1	2	3	8⅜
0	2⅛	0	7	0	6⅛	1	7⅝	0	10⅛	2	8¼	1	2⅛	3	8¾
0	2¼	0	7½	0	6¼	1	8	0	10¼	2	8⅝	1	2¼	3	9⅛
0	2⅜	0	7⅞	0	6⅜	1	8⅜	0	10⅜	2	9	1	2⅜	3	9½
0	2½	0	8¼	0	6½	1	8¾	0	10½	2	9⅜	1	2½	3	9⅞
0	2⅝	0	8⅝	0	6⅝	1	9⅛	0	10⅝	2	9¾	1	2⅝	3	10⅜
0	2¾	0	9	0	6¾	1	9½	0	10¾	2	10⅛	1	2¾	3	10¾
0	2⅞	0	9⅜	0	6⅞	1	10	0	10⅞	2	10½	1	2⅞	3	11⅛
0	3	0	9¾	0	7	1	10⅜	0	11	2	10⅞	1	3	3	11½
0	3⅛	0	10¼	0	7⅛	1	10¾	0	11⅛	2	11⅜	1	3⅛	3	11⅞
0	3¼	0	10½	0	7¼	1	11⅛	0	11¼	2	11¾	1	3¼	4	0¼
0	3⅜	0	11	0	7⅜	1	11½	0	11⅜	3	0⅛	1	3⅜	4	0⅝
0	3½	0	11⅜	0	7½	1	11⅞	0	11½	3	0½	1	3½	4	1
0	3⅝	0	11¾	0	7⅝	2	0⅜	0	11⅝	3	0⅞	1	3⅝	4	1⅜
0	3¾	1	0⅛	0	7¾	2	0¾	0	11¾	3	1¼	1	3¾	4	1⅞
0	3⅞	1	0½	0	7⅞	2	1⅛	0	11⅞	3	1⅝	1	3⅞	4	2¼
0	4	1	0⅞	0	8	2	1½	1	0	3	2	1	4	4	2⅝
0	4⅛	1	1⅜	0	8⅛	2	1⅞	1	0⅛	3	2½	1	4⅛	4	3
0	4¼	1	1¾	0	8¼	2	2⅜	1	0¼	3	2⅞	1	4¼	4	3⅜
0	4⅜	1	2⅛	0	8⅜	2	2¾	1	0⅜	3	3¼	1	4⅜	4	3¾
0	4½	1	2½	0	8½	2	3⅛	1	0½	3	3⅝	1	4½	4	4⅛
0	4⅝	1	2⅞	0	8⅝	2	3½	1	0⅝	3	4	1	4⅝	4	4½
0	4¾	1	3¼	0	8¾	2	3⅞	1	0¾	3	4⅜	1	4¾	4	5
0	4⅞	1	3⅝	0	8⅞	2	4¼	1	0⅞	3	4⅞	1	4⅞	4	5⅜

FOR PIPE MAKING.—Thickness of Plate $\frac{1}{8}$ of an Inch.

Inside Diameter of Pipe.		Length Between Centres of Rivet Holes.		Inside Diameter of Pipe.		Length Between Centres of Rivet Holes.		Inside Diameter of Pipe.		Length Between Centres of Rivet Holes.		Inside Diameter of Pipe.		Length Between Centres of Rivet Holes.	
FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN	FT.	IN.	FT.	IN.	FT.	IN.
1	5	4	$5\frac{3}{4}$	1	9	5	$6\frac{3}{8}$	2	1	6	$6\frac{7}{8}$	2	5	7	$7\frac{1}{2}$
1	$5\frac{1}{8}$	4	$6\frac{1}{8}$	1	$9\frac{1}{8}$	5	$6\frac{3}{4}$	2	$1\frac{1}{8}$	6	$7\frac{1}{4}$	2	$5\frac{1}{8}$	7	$7\frac{7}{8}$
1	$5\frac{1}{4}$	4	$6\frac{1}{2}$	1	$9\frac{1}{4}$	5	$7\frac{1}{8}$	2	$1\frac{1}{4}$	6	$7\frac{5}{8}$	2	$5\frac{1}{4}$	7	$8\frac{1}{4}$
1	$5\frac{3}{8}$	4	7	1	$9\frac{3}{8}$	5	$7\frac{1}{2}$	2	$1\frac{3}{8}$	6	$8\frac{1}{8}$	2	$5\frac{3}{8}$	7	$8\frac{5}{8}$
1	$5\frac{1}{2}$	4	$7\frac{3}{8}$	1	$9\frac{1}{2}$	5	8	2	$1\frac{1}{2}$	6	$8\frac{1}{2}$	2	$5\frac{1}{2}$	7	9
1	$5\frac{5}{8}$	4	$7\frac{3}{4}$	1	$9\frac{5}{8}$	5	$8\frac{3}{8}$	2	$1\frac{5}{8}$	6	$8\frac{7}{8}$	2	$5\frac{5}{8}$	7	$9\frac{3}{8}$
1	$5\frac{3}{4}$	4	$8\frac{1}{8}$	1	$9\frac{3}{4}$	5	$8\frac{3}{4}$	2	$1\frac{3}{4}$	6	$9\frac{1}{4}$	2	$5\frac{3}{4}$	7	$9\frac{3}{4}$
1	$5\frac{7}{8}$	4	$8\frac{1}{2}$	1	$9\frac{7}{8}$	5	$9\frac{1}{8}$	2	$1\frac{7}{8}$	6	$9\frac{5}{8}$	2	$5\frac{7}{8}$	7	$10\frac{1}{4}$
1	6	4	$8\frac{7}{8}$	1	10	5	$9\frac{1}{2}$	2	2	6	10	2	6	7	$10\frac{5}{8}$
1	$6\frac{1}{8}$	4	$9\frac{1}{4}$	1	$10\frac{1}{8}$	5	$9\frac{7}{8}$	2	$2\frac{1}{8}$	6	$10\frac{1}{8}$	2	$6\frac{1}{8}$	7	11
1	$6\frac{1}{4}$	4	$9\frac{5}{8}$	1	$10\frac{1}{4}$	5	$10\frac{1}{4}$	2	$2\frac{1}{4}$	6	$10\frac{7}{8}$	2	$6\frac{1}{4}$	7	$11\frac{3}{8}$
1	$6\frac{3}{8}$	4	10	1	$10\frac{3}{8}$	5	$10\frac{5}{8}$	2	$2\frac{3}{8}$	6	$11\frac{1}{4}$	2	$6\frac{3}{8}$	7	$11\frac{3}{4}$
1	$6\frac{1}{2}$	4	$10\frac{1}{2}$	1	$10\frac{1}{2}$	5	11	2	$2\frac{1}{2}$	6	$11\frac{5}{8}$	2	$6\frac{1}{2}$	8	$0\frac{1}{8}$
1	$6\frac{5}{8}$	4	$10\frac{7}{8}$	1	$10\frac{5}{8}$	5	$11\frac{1}{2}$	2	$2\frac{5}{8}$	7	0	2	$6\frac{5}{8}$	8	$0\frac{1}{2}$
1	$6\frac{3}{4}$	4	$11\frac{1}{4}$	1	$10\frac{3}{4}$	5	$11\frac{7}{8}$	2	$2\frac{3}{4}$	7	$0\frac{3}{8}$	2	$6\frac{3}{4}$	8	1
1	$6\frac{7}{8}$	4	$11\frac{5}{8}$	1	$10\frac{7}{8}$	6	$0\frac{1}{4}$	2	$2\frac{7}{8}$	7	$0\frac{3}{4}$	2	$6\frac{7}{8}$	8	$1\frac{3}{8}$
1	7	5	0	1	11	6	$0\frac{5}{8}$	2	3	7	$1\frac{1}{8}$	2	7	8	$1\frac{3}{4}$
1	$7\frac{1}{8}$	5	$0\frac{3}{8}$	1	$11\frac{1}{8}$	6	1	2	$3\frac{1}{8}$	7	$1\frac{1}{2}$	2	$7\frac{1}{8}$	8	$2\frac{1}{8}$
1	$7\frac{1}{4}$	5	$0\frac{7}{8}$	1	$11\frac{1}{4}$	6	$1\frac{3}{8}$	2	$3\frac{1}{4}$	7	2	2	$7\frac{1}{4}$	8	$2\frac{1}{2}$
1	$7\frac{3}{8}$	5	$1\frac{1}{4}$	1	$11\frac{3}{8}$	6	$1\frac{3}{4}$	2	$3\frac{3}{8}$	7	$2\frac{3}{8}$	2	$7\frac{3}{8}$	8	$2\frac{7}{8}$
1	$7\frac{1}{2}$	5	$1\frac{5}{8}$	1	$11\frac{1}{2}$	6	$2\frac{1}{4}$	2	$3\frac{1}{2}$	7	$2\frac{3}{4}$	2	$7\frac{1}{2}$	8	$3\frac{3}{8}$
1	$7\frac{5}{8}$	5	2	1	$11\frac{5}{8}$	6	$2\frac{5}{8}$	2	$3\frac{5}{8}$	7	$3\frac{1}{8}$	2	$7\frac{5}{8}$	8	$3\frac{3}{4}$
1	$7\frac{3}{4}$	5	$2\frac{3}{8}$	1	$11\frac{3}{4}$	6	3	2	$3\frac{3}{4}$	7	$3\frac{1}{2}$	2	$7\frac{3}{4}$	8	$4\frac{1}{8}$
1	$7\frac{7}{8}$	5	$2\frac{3}{4}$	1	$11\frac{7}{8}$	6	$3\frac{3}{8}$	2	$3\frac{7}{8}$	7	$3\frac{7}{8}$	2	$7\frac{7}{8}$	8	$4\frac{1}{2}$
1	8	5	$3\frac{1}{8}$	2	0	6	$3\frac{3}{4}$	2	4	7	$4\frac{3}{8}$	2	8	8	$4\frac{7}{8}$
1	$8\frac{1}{8}$	5	$3\frac{3}{8}$	2	$0\frac{1}{8}$	6	$4\frac{1}{8}$	2	$4\frac{1}{8}$	7	$4\frac{3}{4}$	2	$8\frac{1}{8}$	8	$5\frac{1}{4}$
1	$8\frac{1}{4}$	5	4	2	$0\frac{1}{4}$	6	$4\frac{1}{2}$	2	$4\frac{1}{4}$	7	$5\frac{1}{8}$	2	$8\frac{1}{4}$	8	$5\frac{5}{8}$
1	$8\frac{3}{8}$	5	$4\frac{3}{8}$	2	$0\frac{3}{8}$	6	$4\frac{7}{8}$	2	$4\frac{3}{8}$	7	$5\frac{1}{2}$	2	$8\frac{3}{8}$	8	6
1	$8\frac{1}{2}$	5	$4\frac{3}{4}$	2	$0\frac{1}{2}$	6	$5\frac{3}{8}$	2	$4\frac{1}{2}$	7	$5\frac{7}{8}$	2	$8\frac{1}{2}$	8	$6\frac{1}{2}$
1	$8\frac{5}{8}$	5	$5\frac{1}{8}$	2	$0\frac{5}{8}$	6	$5\frac{3}{4}$	2	$4\frac{5}{8}$	7	$6\frac{1}{4}$	2	$8\frac{5}{8}$	8	$6\frac{7}{8}$
1	$8\frac{3}{4}$	5	$5\frac{1}{2}$	2	$0\frac{3}{4}$	6	$6\frac{1}{8}$	2	$4\frac{3}{4}$	7	$6\frac{5}{8}$	2	$8\frac{3}{4}$	8	$7\frac{1}{4}$
1	$8\frac{7}{8}$	5	$5\frac{7}{8}$	2	$0\frac{7}{8}$	6	$6\frac{1}{2}$	2	$4\frac{7}{8}$	7	7	2	$8\frac{7}{8}$	8	$7\frac{5}{8}$

TABLE XXII.

FOR PIPE MAKING.—Thickness of Plate $\frac{3}{16}$ of an Inch.

Inside Diameter of Pipe.		Length Between Centres of Rivet Holes.		Inside Diameter of Pipe.		Length Between Centres of Rivet Holes.		Inside Diameter of Pipe.		Length Between Centres of Rivet Holes.		Inside Diameter of Pipe.		Length Between Centres of Rivet Holes.	
FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN	FT.	IN.	FT.	IN.	FT.	IN.
0	1	0	$3\frac{11}{16}$	0	5	1	$4\frac{1}{4}$	0	9	2	$4\frac{13}{16}$	1	1	3	$5\frac{3}{8}$
0	$1\frac{1}{8}$	0	$4\frac{1}{16}$	0	$5\frac{1}{8}$	1	$4\frac{11}{16}$	0	$9\frac{1}{8}$	2	$5\frac{1}{4}$	1	$1\frac{1}{8}$	3	$5\frac{13}{16}$
0	$1\frac{1}{4}$	0	$4\frac{1}{2}$	0	$5\frac{1}{4}$	1	$5\frac{1}{16}$	0	$9\frac{1}{4}$	2	$5\frac{5}{8}$	1	$1\frac{1}{4}$	3	$6\frac{3}{16}$
0	$1\frac{3}{8}$	0	$4\frac{7}{8}$	0	$5\frac{3}{8}$	1	$5\frac{7}{16}$	0	$9\frac{3}{8}$	2	6	1	$1\frac{3}{8}$	3	$6\frac{9}{16}$
0	$1\frac{1}{2}$	0	$5\frac{1}{4}$	0	$5\frac{1}{2}$	1	$5\frac{13}{16}$	0	$9\frac{1}{2}$	2	$6\frac{3}{8}$	1	$1\frac{1}{2}$	3	7
0	$1\frac{5}{8}$	0	$5\frac{11}{16}$	0	$5\frac{5}{8}$	1	$6\frac{1}{4}$	0	$9\frac{5}{8}$	2	$6\frac{13}{16}$	1	$1\frac{5}{8}$	3	$7\frac{3}{8}$
0	$1\frac{3}{4}$	0	$6\frac{1}{16}$	0	$5\frac{3}{4}$	1	$6\frac{5}{8}$	0	$9\frac{3}{4}$	2	$7\frac{3}{16}$	1	$1\frac{3}{4}$	3	$7\frac{3}{4}$
0	$1\frac{7}{8}$	0	$6\frac{7}{16}$	0	$5\frac{7}{8}$	1	7	0	$9\frac{7}{8}$	2	$7\frac{9}{16}$	1	$1\frac{7}{8}$	3	$8\frac{1}{8}$
0	2	0	$6\frac{13}{16}$	0	6	1	$7\frac{7}{16}$	0	10	2	8	1	2	3	$8\frac{9}{16}$
0	$2\frac{1}{8}$	0	$7\frac{1}{4}$	0	$6\frac{1}{8}$	1	$7\frac{13}{16}$	0	$10\frac{1}{8}$	2	$8\frac{3}{8}$	1	$2\frac{1}{8}$	3	$8\frac{15}{16}$
0	$2\frac{1}{4}$	0	$7\frac{5}{8}$	0	$6\frac{1}{4}$	1	$8\frac{3}{16}$	0	$10\frac{1}{4}$	2	$8\frac{3}{4}$	1	$2\frac{1}{4}$	3	$9\frac{5}{16}$
0	$2\frac{3}{8}$	0	8	0	$6\frac{3}{8}$	1	$8\frac{9}{16}$	0	$10\frac{3}{8}$	2	$9\frac{1}{8}$	1	$2\frac{3}{8}$	3	$9\frac{11}{16}$
0	$2\frac{1}{2}$	0	$8\frac{7}{16}$	0	$6\frac{1}{2}$	1	9	0	$10\frac{1}{2}$	2	$9\frac{9}{16}$	1	$2\frac{1}{2}$	3	$10\frac{1}{8}$
0	$2\frac{5}{8}$	0	$8\frac{13}{16}$	0	$6\frac{5}{8}$	1	$9\frac{3}{8}$	0	$10\frac{5}{8}$	2	$9\frac{15}{16}$	1	$2\frac{5}{8}$	3	$10\frac{1}{2}$
0	$2\frac{3}{4}$	0	$9\frac{3}{16}$	0	$6\frac{3}{4}$	1	$9\frac{3}{4}$	0	$10\frac{3}{4}$	2	$10\frac{5}{16}$	1	$2\frac{3}{4}$	3	$10\frac{7}{8}$
0	$2\frac{7}{8}$	0	$9\frac{9}{16}$	0	$6\frac{7}{8}$	1	$10\frac{1}{8}$	0	$10\frac{7}{8}$	2	$10\frac{3}{4}$	1	$2\frac{7}{8}$	3	$11\frac{5}{16}$
0	3	0	10	0	7	1	$10\frac{9}{16}$	0	11	2	$11\frac{1}{8}$	1	3	3	$11\frac{11}{16}$
0	$3\frac{1}{8}$	0	$10\frac{3}{8}$	0	$7\frac{1}{8}$	1	$10\frac{15}{16}$	0	$11\frac{1}{8}$	2	$11\frac{1}{2}$	1	$3\frac{1}{8}$	4	$0\frac{1}{16}$
0	$3\frac{1}{4}$	0	$10\frac{3}{4}$	0	$7\frac{1}{4}$	1	$11\frac{5}{16}$	0	$11\frac{1}{4}$	2	$11\frac{7}{8}$	1	$3\frac{1}{4}$	4	$0\frac{7}{16}$
0	$3\frac{3}{8}$	0	$11\frac{3}{16}$	0	$7\frac{3}{8}$	1	$11\frac{3}{4}$	0	$11\frac{3}{8}$	3	$0\frac{5}{16}$	1	$3\frac{3}{8}$	4	$0\frac{7}{8}$
0	$3\frac{1}{2}$	0	$11\frac{9}{16}$	0	$7\frac{1}{2}$	2	$0\frac{1}{8}$	0	$11\frac{1}{2}$	3	$0\frac{11}{16}$	1	$3\frac{1}{2}$	4	$1\frac{1}{4}$
0	$3\frac{5}{8}$	0	$11\frac{15}{16}$	0	$7\frac{5}{8}$	2	$0\frac{1}{2}$	0	$11\frac{5}{8}$	3	$1\frac{1}{16}$	1	$3\frac{5}{8}$	4	$1\frac{5}{8}$
0	$3\frac{3}{4}$	1	$0\frac{5}{16}$	0	$7\frac{3}{4}$	2	$0\frac{7}{8}$	0	$11\frac{3}{4}$	3	$1\frac{1}{2}$	1	$3\frac{3}{4}$	4	$2\frac{1}{16}$
0	$3\frac{7}{8}$	1	$0\frac{3}{4}$	0	$7\frac{7}{8}$	2	$1\frac{5}{16}$	0	$11\frac{7}{8}$	3	$1\frac{7}{8}$	1	$3\frac{7}{8}$	4	$2\frac{7}{16}$
0	4	1	$1\frac{1}{8}$	0	8	2	$1\frac{11}{16}$	1	0	3	$2\frac{1}{4}$	1	4	4	$2\frac{13}{16}$
0	$4\frac{1}{8}$	1	$1\frac{1}{2}$	0	$8\frac{1}{8}$	2	$2\frac{1}{16}$	1	$0\frac{1}{8}$	3	$2\frac{5}{8}$	1	$4\frac{1}{8}$	4	$3\frac{3}{16}$
0	$4\frac{1}{4}$	1	$1\frac{15}{16}$	0	$8\frac{1}{4}$	2	$2\frac{1}{2}$	1	$0\frac{1}{4}$	3	$3\frac{1}{16}$	1	$4\frac{1}{4}$	4	$3\frac{5}{8}$
0	$4\frac{3}{8}$	1	$2\frac{5}{16}$	0	$8\frac{3}{8}$	2	$2\frac{7}{8}$	1	$0\frac{3}{8}$	3	$3\frac{7}{16}$	1	$4\frac{3}{8}$	4	4
0	$4\frac{1}{2}$	1	$2\frac{11}{16}$	0	$8\frac{1}{2}$	2	$3\frac{1}{4}$	1	$0\frac{1}{2}$	3	$3\frac{13}{16}$	1	$4\frac{1}{2}$	4	$4\frac{3}{8}$
0	$4\frac{5}{8}$	1	$3\frac{1}{16}$	0	$8\frac{5}{8}$	2	$3\frac{5}{8}$	1	$0\frac{5}{8}$	3	$4\frac{1}{4}$	1	$4\frac{5}{8}$	4	$4\frac{13}{16}$
0	$4\frac{3}{4}$	1	$3\frac{1}{2}$	0	$8\frac{3}{4}$	2	$4\frac{1}{16}$	1	$0\frac{3}{4}$	3	$4\frac{5}{8}$	1	$4\frac{3}{4}$	4	$5\frac{3}{16}$
0	$4\frac{7}{8}$	1	$3\frac{7}{8}$	0	$8\frac{7}{8}$	2	$4\frac{7}{16}$	1	$0\frac{7}{8}$	3	5	1	$4\frac{7}{8}$	4	$5\frac{9}{16}$

FOR PIPE MAKING.—Thickness of Plate $\frac{3}{16}$ of an Inch.

Inside Diameter of Pipe.		Length Between Centres of Rivet Holes.		Inside Diameter of Pipe.		Length Between Centres of Rivet Holes.		Inside Diameter of Pipe.		Length Between Centres of Rivet Holes.		Inside Diameter of Pipe.		Length Between Centres of Rivet Holes.	
FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN	FT.	IN.	FT.	IN.	FT.	IN
1	5	4	$5\frac{5}{16}$	1	9	5	$6\frac{9}{16}$	2	1	6	$7\frac{1}{8}$	2	5	7	$7\frac{11}{16}$
1	$5\frac{1}{8}$	4	$6\frac{3}{8}$	1	$9\frac{1}{8}$	5	$6\frac{15}{16}$	2	$1\frac{1}{8}$	6	$7\frac{1}{2}$	2	$5\frac{1}{8}$	7	8
1	$5\frac{1}{4}$	4	$6\frac{3}{4}$	1	$9\frac{1}{4}$	5	$7\frac{5}{16}$	2	$1\frac{1}{4}$	6	$7\frac{7}{8}$	2	$5\frac{1}{4}$	7	$8\frac{7}{16}$
1	$5\frac{3}{8}$	4	$7\frac{1}{4}$	1	$9\frac{3}{8}$	5	$7\frac{11}{16}$	2	$1\frac{3}{8}$	6	$8\frac{1}{4}$	2	$5\frac{3}{8}$	7	$8\frac{13}{16}$
1	$5\frac{1}{2}$	4	$7\frac{9}{16}$	1	$9\frac{1}{2}$	5	$8\frac{1}{8}$	2	$1\frac{1}{2}$	6	$8\frac{11}{16}$	2	$5\frac{1}{2}$	7	$9\frac{1}{4}$
1	$5\frac{5}{8}$	4	$7\frac{15}{16}$	1	$9\frac{5}{8}$	5	$8\frac{1}{2}$	2	$1\frac{5}{8}$	6	$9\frac{1}{16}$	2	$5\frac{5}{8}$	7	$9\frac{3}{8}$
1	$5\frac{3}{4}$	4	$8\frac{5}{16}$	1	$9\frac{3}{4}$	5	$8\frac{7}{8}$	2	$1\frac{3}{4}$	6	$9\frac{7}{16}$	2	$5\frac{3}{4}$	7	10
1	$5\frac{7}{8}$	4	$8\frac{3}{4}$	1	$9\frac{7}{8}$	5	$9\frac{1}{4}$	2	$1\frac{7}{8}$	6	$9\frac{7}{8}$	2	$5\frac{7}{8}$	7	$10\frac{7}{16}$
1	6	4	$9\frac{1}{8}$	1	10	5	$9\frac{11}{16}$	2	2	6	$10\frac{1}{4}$	2	6	7	$10\frac{13}{16}$
1	$6\frac{1}{8}$	4	$9\frac{1}{2}$	1	$10\frac{1}{8}$	5	$10\frac{1}{16}$	2	$2\frac{1}{8}$	6	$10\frac{5}{8}$	2	$6\frac{1}{8}$	7	$11\frac{3}{16}$
1	$6\frac{1}{4}$	4	$9\frac{7}{8}$	1	$10\frac{1}{4}$	5	$10\frac{7}{16}$	2	$2\frac{1}{4}$	6	11	2	$6\frac{1}{4}$	7	$11\frac{9}{16}$
1	$6\frac{3}{8}$	4	$10\frac{5}{16}$	1	$10\frac{3}{8}$	5	$10\frac{7}{8}$	2	$2\frac{3}{8}$	6	$11\frac{7}{16}$	2	$6\frac{3}{8}$	8	0
1	$6\frac{1}{2}$	4	$10\frac{11}{16}$	1	$10\frac{1}{2}$	5	$11\frac{1}{4}$	2	$2\frac{1}{2}$	6	$11\frac{13}{16}$	2	$6\frac{1}{2}$	8	$0\frac{3}{8}$
1	$6\frac{5}{8}$	4	$11\frac{1}{16}$	1	$10\frac{5}{8}$	5	$11\frac{5}{8}$	2	$2\frac{5}{8}$	7	$0\frac{3}{16}$	2	$6\frac{5}{8}$	8	$0\frac{3}{4}$
1	$6\frac{3}{4}$	4	$11\frac{7}{16}$	1	$10\frac{3}{4}$	6	0	2	$2\frac{3}{4}$	7	$0\frac{5}{8}$	2	$6\frac{3}{4}$	8	$1\frac{3}{16}$
1	$6\frac{7}{8}$	4	$11\frac{7}{8}$	1	$10\frac{7}{8}$	6	$0\frac{7}{16}$	2	$2\frac{7}{8}$	7	1	2	$6\frac{7}{8}$	8	$1\frac{9}{16}$
1	7	5	$0\frac{1}{4}$	1	11	6	$0\frac{13}{16}$	2	3	7	$1\frac{3}{8}$	2	7	8	$1\frac{15}{16}$
1	$7\frac{1}{8}$	5	$0\frac{5}{8}$	1	$11\frac{1}{8}$	6	$1\frac{3}{16}$	2	$3\frac{1}{8}$	7	$1\frac{3}{4}$	2	$7\frac{1}{8}$	8	$2\frac{5}{16}$
1	$7\frac{1}{4}$	5	$1\frac{1}{16}$	1	$11\frac{1}{4}$	6	$1\frac{5}{8}$	2	$3\frac{1}{4}$	7	$2\frac{3}{16}$	2	$7\frac{1}{4}$	8	$2\frac{3}{4}$
1	$7\frac{3}{8}$	5	$1\frac{7}{16}$	1	$11\frac{3}{8}$	6	2	2	$3\frac{3}{8}$	7	$2\frac{9}{16}$	2	$7\frac{3}{8}$	8	$3\frac{1}{8}$
1	$7\frac{1}{2}$	5	$1\frac{13}{16}$	1	$11\frac{1}{2}$	6	$2\frac{3}{8}$	2	$3\frac{1}{2}$	7	$2\frac{15}{16}$	2	$7\frac{1}{2}$	8	$3\frac{1}{2}$
1	$7\frac{5}{8}$	5	$2\frac{3}{16}$	1	$11\frac{5}{8}$	6	$2\frac{3}{4}$	2	$3\frac{5}{8}$	7	$3\frac{3}{8}$	2	$7\frac{5}{8}$	8	$3\frac{15}{16}$
1	$7\frac{3}{4}$	5	$2\frac{5}{8}$	1	$11\frac{3}{4}$	6	$3\frac{3}{16}$	2	$3\frac{3}{4}$	7	$3\frac{3}{4}$	2	$7\frac{3}{4}$	8	$4\frac{5}{16}$
1	$7\frac{7}{8}$	5	3	1	$11\frac{7}{8}$	6	$3\frac{9}{16}$	2	$3\frac{7}{8}$	7	$4\frac{1}{8}$	2	$7\frac{7}{8}$	8	$4\frac{11}{16}$
1	8	5	$3\frac{3}{8}$	2	0	6	$3\frac{15}{16}$	2	4	7	$4\frac{1}{2}$	2	8	8	$5\frac{1}{16}$
1	$8\frac{1}{8}$	5	$3\frac{3}{4}$	2	$0\frac{1}{8}$	6	$4\frac{3}{16}$	2	$4\frac{1}{8}$	7	$4\frac{15}{16}$	2	$8\frac{1}{8}$	8	$5\frac{1}{2}$
1	$8\frac{1}{4}$	5	$4\frac{3}{16}$	2	$0\frac{1}{4}$	6	$4\frac{3}{4}$	2	$4\frac{1}{4}$	7	$5\frac{5}{16}$	2	$8\frac{1}{4}$	8	$5\frac{7}{8}$
1	$8\frac{3}{8}$	5	$4\frac{9}{16}$	2	$0\frac{3}{8}$	6	$5\frac{1}{8}$	2	$4\frac{3}{8}$	7	$5\frac{11}{16}$	2	$8\frac{3}{8}$	8	$6\frac{1}{4}$
1	$8\frac{1}{2}$	5	$4\frac{15}{16}$	2	$0\frac{1}{2}$	6	$5\frac{1}{2}$	2	$4\frac{1}{2}$	7	$6\frac{1}{16}$	2	$8\frac{1}{2}$	8	$6\frac{11}{16}$
1	$8\frac{5}{8}$	5	$5\frac{3}{8}$	2	$0\frac{5}{8}$	6	$5\frac{15}{16}$	2	$4\frac{5}{8}$	7	$6\frac{1}{2}$	2	$8\frac{5}{8}$	8	$7\frac{1}{16}$
1	$8\frac{3}{4}$	5	$5\frac{3}{4}$	2	$0\frac{3}{4}$	6	$6\frac{5}{16}$	2	$4\frac{3}{4}$	7	$6\frac{7}{8}$	2	$8\frac{3}{4}$	8	$7\frac{7}{16}$
1	$8\frac{7}{8}$	5	$6\frac{1}{8}$	2	$0\frac{7}{8}$	6	$6\frac{11}{16}$	2	$4\frac{7}{8}$	7	$7\frac{1}{4}$	2	$8\frac{7}{8}$	8	$7\frac{13}{16}$

TABLE XXIII.

FOR PIPE MAKING.—Thickness of Plate ¼ of an Inch.

Inside Diameter of Pipe.		Length Between Centres of Rivet Holes.		Inside Diameter of Pipe.		Length Between Centres of Rivet Holes.		Inside Diameter of Pipe.		Length Between Centres of Rivet Holes.		Inside Diameter of Pipe.		Length Between Centres of Rivet Holes.	
FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN	FT.	IN.	FT.	IN.	FT.	IN
0	1	0	3 7/8	0	5	1	4 1/2	0	9	2	5	1	1	3	5 5/8
0	1 1/8	0	4 1/4	0	5 1/8	1	4 7/8	0	9 1/8	2	5 1/2	1	1 1/8	3	6
0	1 1/4	0	4 5/8	0	5 1/4	1	5 1/4	0	9 1/4	2	5 7/8	1	1 1/4	3	6 3/8
0	1 3/8	0	5	0	5 3/8	1	5 5/8	0	9 3/8	2	6 1/4	1	1 3/8	3	6 3/4
0	1 1/2	0	5 3/8	0	5 1/2	1	6	0	9 1/2	2	6 5/8	1	1 1/2	3	7 1/8
0	1 5/8	0	5 7/8	0	5 5/8	1	6 1/2	0	9 5/8	2	7	1	1 5/8	3	7 5/8
0	1 3/4	0	6 1/4	0	5 3/4	1	6 7/8	0	9 3/4	2	7 3/8	1	1 3/4	3	8
0	1 7/8	0	6 5/8	0	5 7/8	1	7 1/4	0	9 7/8	2	7 3/4	1	1 7/8	3	8 3/8
0	2	0	7	0	6	1	7 5/8	0	10	2	8 1/4	1	2	3	8 3/4
0	2 1/8	0	7 1/2	0	6 1/8	1	8	0	10 1/8	2	8 5/8	1	2 1/8	3	9 1/8
0	2 1/4	0	7 7/8	0	6 1/4	1	8 3/8	0	10 1/4	2	9	1	2 1/4	3	9 1/2
0	2 3/8	0	8 1/4	0	6 3/8	1	8 3/4	0	10 3/8	2	9 3/8	1	2 3/8	3	9 7/8
0	2 1/2	0	8 5/8	0	6 1/2	1	9 1/8	0	10 1/2	2	9 3/4	1	2 1/2	3	10 3/8
0	2 5/8	0	9	0	6 5/8	1	9 1/2	0	10 5/8	2	10 1/8	1	2 5/8	3	10 3/4
0	2 3/4	0	9 3/8	0	6 3/4	1	10	0	10 3/4	2	10 1/2	1	2 3/4	3	11 1/8
0	2 7/8	0	9 3/4	0	6 7/8	1	10 3/8	0	10 7/8	2	10 7/8	1	2 7/8	3	11 1/2
0	3	0	10 1/4	0	7	1	10 3/4	0	11	2	11 3/8	1	3	3	11 7/8
0	3 1/8	0	10 1/2	0	7 1/8	1	11 1/8	0	11 1/8	2	11 3/4	1	3 1/8	4	0 1/4
0	3 1/4	0	11	0	7 1/4	1	11 1/2	0	11 1/4	3	0 1/8	1	3 1/4	4	0 5/8
0	3 3/8	0	11 3/8	0	7 3/8	1	11 7/8	0	11 3/8	3	0 1/2	1	3 3/8	4	1
0	3 1/2	0	11 3/4	0	7 1/2	2	0 3/8	0	11 1/2	3	0 7/8	1	3 1/2	4	1 3/8
0	3 5/8	1	0 1/8	0	7 5/8	2	0 3/4	0	11 5/8	3	1 1/4	1	3 5/8	4	1 7/8
0	3 3/4	1	0 1/2	0	7 3/4	2	1 1/8	0	11 3/4	3	1 5/8	1	3 3/4	4	2 1/4
0	3 7/8	1	0 7/8	0	7 7/8	2	1 1/2	0	11 7/8	3	2	1	3 7/8	4	2 5/8
0	4	1	1 3/8	0	8	2	1 7/8	1	0	3	2 1/2	1	4	4	3
0	4 1/8	1	1 3/4	0	8 1/8	2	2 3/8	1	0 1/8	3	2 7/8	1	4 1/8	4	3 3/8
0	4 1/4	1	2 1/8	0	8 1/4	2	2 3/4	1	0 1/4	3	3 1/4	1	4 1/4	4	3 3/4
0	4 3/8	1	2 1/2	0	8 3/8	2	3 1/8	1	0 3/8	3	3 5/8	1	4 3/8	4	4 1/8
0	4 1/2	1	2 7/8	0	8 1/2	2	3 1/2	1	0 1/2	3	4	1	4 1/2	4	4 1/2
0	4 5/8	1	3 1/4	0	8 5/8	2	3 7/8	1	0 5/8	3	4 3/8	1	4 5/8	4	5
0	4 3/4	1	3 5/8	0	8 3/4	2	4 1/4	1	0 3/4	3	4 7/8	1	4 3/4	4	5 3/8
0	4 7/8	1	4	0	8 7/8	2	4 5/8	1	0 7/8	3	5 1/4	1	4 7/8	4	5 3/4

FOR PIPE MAKING.—Thickness of Plate $\frac{1}{4}$ of an Inch.

Inside Diameter of Pipe.		Length Between Centres of Rivet Holes.		Inside Diameter of Pipe.		Length Between Centres of Rivet Holes.		Inside Diameter of Pipe.		Length Between Centres of Rivet Holes.		Inside Diameter of Pipe.		Length Between Centres of Rivet Holes.	
FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN	FT.	IN.	FT.	IN.	FT.	IN.
1	5	4	$6\frac{1}{8}$	1	9	5	$6\frac{3}{4}$	2	1	6	$7\frac{1}{4}$	2	5	7	$7\frac{7}{8}$
1	$5\frac{1}{8}$	4	$6\frac{1}{2}$	1	$9\frac{1}{8}$	5	$7\frac{1}{8}$	2	$1\frac{1}{8}$	6	$7\frac{5}{8}$	2	$5\frac{1}{8}$	7	$8\frac{1}{4}$
1	$5\frac{1}{4}$	4	7	1	$9\frac{1}{4}$	5	$7\frac{1}{2}$	2	$1\frac{1}{4}$	6	$8\frac{1}{8}$	2	$5\frac{1}{4}$	7	$8\frac{5}{8}$
1	$5\frac{3}{8}$	4	$7\frac{3}{8}$	1	$9\frac{3}{8}$	5	8	2	$1\frac{3}{8}$	6	$8\frac{1}{2}$	2	$5\frac{3}{8}$	7	9
1	$5\frac{1}{2}$	4	$7\frac{3}{4}$	1	$9\frac{1}{2}$	5	$8\frac{3}{8}$	2	$1\frac{1}{2}$	6	$8\frac{7}{8}$	2	$5\frac{1}{2}$	7	$9\frac{3}{8}$
1	$5\frac{5}{8}$	4	$8\frac{1}{8}$	1	$9\frac{5}{8}$	5	$8\frac{3}{4}$	2	$1\frac{5}{8}$	6	$9\frac{1}{4}$	2	$5\frac{5}{8}$	7	$9\frac{3}{4}$
1	$5\frac{3}{4}$	4	$8\frac{1}{2}$	1	$9\frac{3}{4}$	5	$9\frac{1}{8}$	2	$1\frac{3}{4}$	6	$9\frac{5}{8}$	2	$5\frac{3}{4}$	7	$10\frac{1}{4}$
1	$5\frac{7}{8}$	4	$8\frac{7}{8}$	1	$9\frac{7}{8}$	5	$9\frac{1}{2}$	2	$1\frac{7}{8}$	6	10	2	$5\frac{7}{8}$	7	$10\frac{5}{8}$
1	6	4	$9\frac{1}{4}$	1	10	5	$9\frac{7}{8}$	2	2	6	$10\frac{1}{2}$	2	6	7	11
1	$6\frac{1}{8}$	4	$9\frac{5}{8}$	1	$10\frac{1}{8}$	5	$10\frac{1}{4}$	2	$2\frac{1}{8}$	6	$10\frac{7}{8}$	2	$6\frac{1}{8}$	7	$11\frac{3}{8}$
1	$6\frac{1}{4}$	4	10	1	$10\frac{1}{4}$	5	$10\frac{5}{8}$	2	$2\frac{1}{4}$	6	$11\frac{1}{4}$	2	$6\frac{1}{4}$	7	$11\frac{3}{4}$
1	$6\frac{3}{8}$	4	$10\frac{1}{2}$	1	$10\frac{3}{8}$	5	11	2	$2\frac{3}{8}$	6	$11\frac{5}{8}$	2	$6\frac{3}{8}$	8	$0\frac{1}{8}$
1	$6\frac{1}{2}$	4	$10\frac{7}{8}$	1	$10\frac{1}{2}$	5	$11\frac{1}{2}$	2	$2\frac{1}{2}$	7	0	2	$6\frac{1}{2}$	8	$0\frac{1}{2}$
1	$6\frac{5}{8}$	4	$11\frac{1}{4}$	1	$10\frac{5}{8}$	5	$11\frac{7}{8}$	2	$2\frac{5}{8}$	7	$0\frac{3}{8}$	2	$6\frac{5}{8}$	8	1
1	$6\frac{3}{4}$	4	$11\frac{5}{8}$	1	$10\frac{3}{4}$	6	$0\frac{1}{4}$	2	$2\frac{3}{4}$	7	$0\frac{3}{4}$	2	$6\frac{3}{4}$	8	$1\frac{3}{8}$
1	$6\frac{7}{8}$	5	0	1	$10\frac{7}{8}$	6	$0\frac{5}{8}$	2	$2\frac{7}{8}$	7	$1\frac{1}{8}$	2	$6\frac{7}{8}$	8	$1\frac{3}{4}$
1	7	5	$0\frac{3}{8}$	1	11	6	1	2	3	7	$1\frac{1}{2}$	2	7	8	$2\frac{1}{8}$
1	$7\frac{1}{8}$	5	$0\frac{7}{8}$	1	$11\frac{1}{8}$	6	$1\frac{3}{8}$	2	$3\frac{1}{8}$	7	2	2	$7\frac{1}{8}$	8	$2\frac{1}{2}$
1	$7\frac{1}{4}$	5	$1\frac{1}{4}$	1	$11\frac{1}{4}$	6	$1\frac{3}{4}$	2	$3\frac{1}{4}$	7	$2\frac{3}{8}$	2	$7\frac{1}{4}$	8	$2\frac{7}{8}$
1	$7\frac{3}{8}$	5	$1\frac{5}{8}$	1	$11\frac{3}{8}$	6	$2\frac{1}{4}$	2	$3\frac{3}{8}$	7	$2\frac{3}{4}$	2	$7\frac{3}{8}$	8	$3\frac{3}{8}$
1	$7\frac{1}{2}$	5	2	1	$11\frac{1}{2}$	6	$2\frac{5}{8}$	2	$3\frac{1}{2}$	7	$3\frac{1}{8}$	2	$7\frac{1}{2}$	8	$3\frac{3}{4}$
1	$7\frac{5}{8}$	5	$2\frac{3}{8}$	1	$11\frac{5}{8}$	6	3	2	$3\frac{5}{8}$	7	$3\frac{1}{2}$	2	$7\frac{5}{8}$	8	$4\frac{1}{8}$
1	$7\frac{3}{4}$	5	$2\frac{3}{4}$	1	$11\frac{3}{4}$	6	$3\frac{3}{8}$	2	$3\frac{3}{4}$	7	$3\frac{7}{8}$	2	$7\frac{3}{4}$	8	$4\frac{1}{2}$
1	$7\frac{7}{8}$	5	$3\frac{1}{8}$	1	$11\frac{7}{8}$	6	$3\frac{3}{4}$	2	$3\frac{7}{8}$	7	$4\frac{3}{8}$	2	$7\frac{7}{8}$	8	$4\frac{7}{8}$
1	8	5	$3\frac{5}{8}$	2	0	6	$4\frac{1}{8}$	2	4	7	$4\frac{3}{4}$	2	8	8	$5\frac{1}{4}$
1	$8\frac{1}{8}$	5	4	2	$0\frac{1}{8}$	6	$4\frac{1}{2}$	2	$4\frac{1}{8}$	7	$5\frac{1}{8}$	2	$8\frac{1}{8}$	8	$5\frac{5}{8}$
1	$8\frac{1}{4}$	5	$4\frac{3}{8}$	2	$0\frac{1}{4}$	6	$4\frac{7}{8}$	2	$4\frac{1}{4}$	7	$5\frac{1}{2}$	2	$8\frac{1}{4}$	8	6
1	$8\frac{3}{8}$	5	$4\frac{3}{4}$	2	$0\frac{3}{8}$	6	$5\frac{3}{8}$	2	$4\frac{3}{8}$	7	$5\frac{7}{8}$	2	$8\frac{3}{8}$	8	$6\frac{1}{2}$
1	$8\frac{1}{2}$	5	$5\frac{1}{8}$	2	$0\frac{1}{2}$	6	$5\frac{3}{4}$	2	$4\frac{1}{2}$	7	$6\frac{1}{4}$	2	$8\frac{1}{2}$	8	$6\frac{7}{8}$
1	$8\frac{5}{8}$	5	$5\frac{1}{2}$	2	$0\frac{5}{8}$	6	$6\frac{1}{8}$	2	$4\frac{5}{8}$	7	$6\frac{5}{8}$	2	$8\frac{5}{8}$	8	$7\frac{1}{4}$
1	$8\frac{3}{4}$	5	$5\frac{7}{8}$	2	$0\frac{3}{4}$	6	$6\frac{1}{2}$	2	$4\frac{3}{4}$	7	7	2	$8\frac{3}{4}$	8	$7\frac{5}{8}$
1	$8\frac{7}{8}$	5	$6\frac{3}{8}$	2	$0\frac{7}{8}$	6	$6\frac{7}{8}$	2	$4\frac{7}{8}$	7	$7\frac{1}{2}$	2	$8\frac{7}{8}$	8	8

TABLE XXIV.

FOR PIPE MAKING.—Thickness of Plate $\frac{5}{16}$ of an Inch.

Inside Diameter of Pipe.		Length Between Centres of Rivet Holes.		Inside Diameter of Pipe.		Length Between Centres of Rivet Holes.		Inside Diameter of Pipe.		Length Between Centres of Rivet Holes.		Inside Diameter of Pipe.		Length Between Centres of Rivet Holes.	
FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN	FT.	IN.	FT.	IN.	FT.	IN.
0	1	0	$4\frac{1}{16}$	0	5	1	$4\frac{11}{16}$	0	9	2	$5\frac{1}{4}$	1	1	3	$5\frac{13}{16}$
0	$1\frac{1}{8}$	0	$4\frac{1}{2}$	0	$5\frac{1}{8}$	1	$5\frac{1}{16}$	0	$9\frac{1}{8}$	2	$5\frac{5}{8}$	1	$1\frac{1}{8}$	3	$6\frac{3}{16}$
0	$1\frac{1}{4}$	0	$4\frac{7}{8}$	0	$5\frac{1}{4}$	1	$5\frac{7}{16}$	0	$9\frac{1}{4}$	2	6	1	$1\frac{1}{4}$	3	$6\frac{9}{16}$
0	$1\frac{3}{8}$	0	$5\frac{1}{4}$	0	$5\frac{3}{8}$	1	$5\frac{13}{16}$	0	$9\frac{3}{8}$	2	$6\frac{3}{8}$	1	$1\frac{3}{8}$	3	7
0	$1\frac{1}{2}$	0	$5\frac{11}{16}$	0	$5\frac{1}{2}$	1	$6\frac{1}{4}$	0	$9\frac{1}{2}$	2	$6\frac{13}{16}$	1	$1\frac{1}{2}$	3	$7\frac{3}{8}$
0	$1\frac{5}{8}$	0	$6\frac{1}{16}$	0	$5\frac{5}{8}$	1	$6\frac{5}{8}$	0	$9\frac{5}{8}$	2	$7\frac{3}{16}$	1	$1\frac{5}{8}$	3	$7\frac{3}{4}$
0	$1\frac{3}{4}$	0	$6\frac{7}{16}$	0	$5\frac{3}{4}$	1	7	0	$9\frac{3}{4}$	2	$7\frac{9}{16}$	1	$1\frac{3}{4}$	3	$8\frac{1}{8}$
0	$1\frac{7}{8}$	0	$6\frac{13}{16}$	0	$5\frac{7}{8}$	1	$7\frac{7}{16}$	0	$9\frac{7}{8}$	2	8	1	$1\frac{7}{8}$	3	$8\frac{9}{16}$
0	2	0	$7\frac{1}{4}$	0	6	1	$7\frac{13}{16}$	0	10	2	$8\frac{3}{8}$	1	2	3	$8\frac{15}{16}$
0	$2\frac{1}{8}$	0	$7\frac{5}{8}$	0	$6\frac{1}{8}$	1	$8\frac{3}{16}$	0	$10\frac{1}{8}$	2	$8\frac{3}{4}$	1	$2\frac{1}{8}$	3	$9\frac{3}{8}$
0	$2\frac{1}{4}$	0	8	0	$6\frac{1}{4}$	1	$8\frac{9}{16}$	0	$10\frac{1}{4}$	2	$9\frac{1}{8}$	1	$2\frac{1}{4}$	3	$9\frac{3}{4}$
0	$2\frac{3}{8}$	0	$8\frac{7}{16}$	0	$6\frac{3}{8}$	1	9	0	$10\frac{3}{8}$	2	$9\frac{9}{16}$	1	$2\frac{3}{8}$	3	$10\frac{1}{8}$
0	$2\frac{1}{2}$	0	$8\frac{15}{16}$	0	$6\frac{1}{2}$	1	$9\frac{3}{8}$	0	$10\frac{1}{2}$	2	$9\frac{15}{16}$	1	$2\frac{1}{2}$	3	$10\frac{1}{2}$
0	$2\frac{5}{8}$	0	$9\frac{3}{16}$	0	$6\frac{5}{8}$	1	$9\frac{3}{4}$	0	$10\frac{5}{8}$	2	$10\frac{5}{16}$	1	$2\frac{5}{8}$	3	$10\frac{7}{8}$
0	$2\frac{3}{4}$	0	$9\frac{9}{16}$	0	$6\frac{3}{4}$	1	$10\frac{3}{16}$	0	$10\frac{3}{4}$	2	$10\frac{3}{4}$	1	$2\frac{3}{4}$	3	$11\frac{5}{16}$
0	$2\frac{7}{8}$	0	10	0	$6\frac{7}{8}$	1	$10\frac{9}{16}$	0	$10\frac{7}{8}$	2	$11\frac{1}{8}$	1	$2\frac{7}{8}$	3	$11\frac{11}{16}$
0	3	0	$10\frac{3}{8}$	0	7	1	$10\frac{15}{16}$	0	11	2	$11\frac{1}{2}$	1	3	4	$0\frac{1}{16}$
0	$3\frac{1}{8}$	0	$10\frac{3}{4}$	0	$7\frac{1}{8}$	1	$11\frac{5}{16}$	0	$11\frac{1}{8}$	2	$11\frac{7}{8}$	1	$3\frac{1}{8}$	4	$0\frac{7}{16}$
0	$3\frac{1}{4}$	0	$11\frac{3}{16}$	0	$7\frac{1}{4}$	1	$11\frac{3}{4}$	0	$11\frac{1}{4}$	3	$0\frac{5}{16}$	1	$3\frac{1}{4}$	4	$0\frac{7}{8}$
0	$3\frac{3}{8}$	0	$11\frac{9}{16}$	0	$7\frac{3}{8}$	2	$0\frac{1}{8}$	0	$11\frac{3}{8}$	3	$0\frac{11}{16}$	1	$3\frac{3}{8}$	4	$1\frac{1}{4}$
0	$3\frac{1}{2}$	0	$11\frac{15}{16}$	0	$7\frac{1}{2}$	2	$0\frac{1}{2}$	0	$11\frac{1}{2}$	3	$1\frac{1}{16}$	1	$3\frac{1}{2}$	4	$1\frac{5}{8}$
0	$3\frac{5}{8}$	1	$0\frac{5}{16}$	0	$7\frac{5}{8}$	2	$0\frac{7}{8}$	0	$11\frac{5}{8}$	3	$1\frac{1}{2}$	1	$3\frac{5}{8}$	4	$2\frac{1}{16}$
0	$3\frac{3}{4}$	1	$0\frac{3}{4}$	0	$7\frac{3}{4}$	2	$1\frac{5}{16}$	0	$11\frac{3}{4}$	3	$1\frac{7}{8}$	1	$3\frac{3}{4}$	4	$2\frac{7}{16}$
0	$3\frac{7}{8}$	1	$1\frac{1}{8}$	0	$7\frac{7}{8}$	2	$1\frac{11}{16}$	0	$11\frac{7}{8}$	3	$2\frac{1}{4}$	1	$3\frac{7}{8}$	4	$2\frac{13}{16}$
0	4	1	$1\frac{1}{2}$	0	8	2	$2\frac{1}{16}$	1	0	3	$2\frac{5}{8}$	1	4	4	$3\frac{3}{16}$
0	$4\frac{1}{8}$	1	$1\frac{15}{16}$	0	$8\frac{1}{8}$	2	$2\frac{1}{2}$	1	$0\frac{1}{8}$	3	$3\frac{1}{16}$	1	$4\frac{1}{8}$	4	$3\frac{5}{8}$
0	$4\frac{1}{4}$	1	$2\frac{5}{16}$	0	$8\frac{1}{4}$	2	$2\frac{7}{8}$	1	$0\frac{1}{4}$	3	$3\frac{7}{16}$	1	$4\frac{1}{4}$	4	4
0	$4\frac{3}{8}$	1	$2\frac{11}{16}$	0	$8\frac{3}{8}$	2	$3\frac{1}{4}$	1	$0\frac{3}{8}$	3	$3\frac{13}{16}$	1	$4\frac{3}{8}$	4	$4\frac{3}{8}$
0	$4\frac{1}{2}$	1	$3\frac{1}{16}$	0	$8\frac{1}{2}$	2	$3\frac{3}{8}$	1	$0\frac{1}{2}$	3	$4\frac{3}{16}$	1	$4\frac{1}{2}$	4	$4\frac{13}{16}$
0	$4\frac{5}{8}$	1	$3\frac{1}{2}$	0	$8\frac{5}{8}$	2	$4\frac{1}{16}$	1	$0\frac{5}{8}$	3	$4\frac{5}{8}$	1	$4\frac{5}{8}$	4	$5\frac{3}{16}$
0	$4\frac{3}{4}$	1	$3\frac{7}{8}$	0	$8\frac{3}{4}$	2	$4\frac{7}{16}$	1	$0\frac{3}{4}$	3	5	1	$4\frac{3}{4}$	4	$5\frac{9}{16}$
0	$4\frac{7}{8}$	1	$4\frac{1}{4}$	0	$8\frac{7}{8}$	2	$4\frac{13}{16}$	1	$0\frac{7}{8}$	3	$5\frac{3}{8}$	1	$4\frac{7}{8}$	4	$5\frac{15}{16}$

FOR PIPE MAKING.—Thickness of Plate $\frac{5}{16}$ of an Inch.

Inside Diameter of Pipe.		Length Between Centres of Rivet Holes.		Inside Diameter of Pipe.		Length Between Centres of Rivet Holes.		Inside Diameter of Pipe.		Length Between Centres of Rivet Holes.		Inside Diameter of Pipe.		Length Between Centres of Rivet Holes.	
FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN	FT.	IN.	FT.	IN.	FT.	IN.
1	5	4	$6\frac{3}{8}$	1	9	5	$6\frac{15}{16}$	2	1	6	$7\frac{1}{2}$	2	5	7	8
1	$5\frac{1}{8}$	4	$6\frac{3}{4}$	1	$9\frac{1}{8}$	5	$7\frac{5}{16}$	2	$1\frac{1}{8}$	6	$7\frac{7}{8}$	2	$5\frac{1}{8}$	7	$8\frac{7}{16}$
1	$5\frac{1}{4}$	4	$7\frac{1}{8}$	1	$9\frac{1}{4}$	5	$7\frac{11}{16}$	2	$1\frac{1}{4}$	6	$8\frac{1}{4}$	2	$5\frac{1}{4}$	7	$8\frac{13}{16}$
1	$5\frac{3}{8}$	4	$7\frac{9}{16}$	1	$9\frac{3}{8}$	5	$8\frac{1}{8}$	2	$1\frac{3}{8}$	6	$8\frac{11}{16}$	2	$5\frac{3}{8}$	7	$9\frac{1}{4}$
1	$5\frac{1}{2}$	4	$7\frac{15}{16}$	1	$9\frac{1}{2}$	5	$8\frac{1}{2}$	2	$1\frac{1}{2}$	6	$9\frac{1}{16}$	2	$5\frac{1}{2}$	7	$9\frac{5}{8}$
1	$5\frac{5}{8}$	4	$8\frac{5}{16}$	1	$9\frac{5}{8}$	5	$8\frac{7}{8}$	2	$1\frac{5}{8}$	6	$9\frac{7}{16}$	2	$5\frac{5}{8}$	7	10
1	$5\frac{3}{4}$	4	$8\frac{11}{16}$	1	$9\frac{3}{4}$	5	$9\frac{1}{4}$	2	$1\frac{3}{4}$	6	$9\frac{7}{8}$	2	$5\frac{3}{4}$	7	$10\frac{7}{16}$
1	$5\frac{7}{8}$	4	$9\frac{1}{8}$	1	$9\frac{7}{8}$	5	$9\frac{11}{16}$	2	$1\frac{7}{8}$	6	$10\frac{1}{4}$	2	$5\frac{7}{8}$	7	$10\frac{13}{16}$
1	6	4	$9\frac{1}{2}$	1	10	5	$10\frac{1}{16}$	2	2	6	$10\frac{5}{8}$	2	6	7	$11\frac{3}{16}$
1	$6\frac{1}{8}$	4	$9\frac{7}{8}$	1	$10\frac{1}{8}$	5	$10\frac{7}{16}$	2	$2\frac{1}{8}$	6	11	2	$6\frac{1}{8}$	7	$11\frac{9}{16}$
1	$6\frac{1}{4}$	4	$10\frac{5}{16}$	1	$10\frac{1}{4}$	5	$10\frac{7}{8}$	2	$2\frac{1}{4}$	6	$11\frac{7}{16}$	2	$6\frac{1}{4}$	8	0
1	$6\frac{3}{8}$	4	$10\frac{11}{16}$	1	$10\frac{3}{8}$	5	$11\frac{1}{4}$	2	$2\frac{3}{8}$	6	$11\frac{13}{16}$	2	$6\frac{3}{8}$	8	$0\frac{3}{8}$
1	$6\frac{1}{2}$	4	$11\frac{1}{16}$	1	$10\frac{1}{2}$	5	$11\frac{5}{8}$	2	$2\frac{1}{2}$	7	$0\frac{3}{16}$	2	$6\frac{1}{2}$	8	$0\frac{3}{4}$
1	$6\frac{5}{8}$	4	$11\frac{7}{16}$	1	$10\frac{5}{8}$	6	0	2	$2\frac{5}{8}$	7	$0\frac{5}{8}$	2	$6\frac{5}{8}$	8	$1\frac{3}{16}$
1	$6\frac{3}{4}$	4	$11\frac{7}{8}$	1	$10\frac{3}{4}$	6	$0\frac{7}{16}$	2	$2\frac{3}{4}$	7	1	2	$6\frac{3}{4}$	8	$1\frac{9}{16}$
1	$6\frac{7}{8}$	5	$0\frac{1}{4}$	1	$10\frac{7}{8}$	6	$0\frac{13}{16}$	2	$2\frac{7}{8}$	7	$1\frac{3}{8}$	2	$6\frac{7}{8}$	8	$1\frac{15}{16}$
1	7	5	$0\frac{5}{8}$	1	11	6	$1\frac{3}{16}$	2	3	7	$1\frac{3}{4}$	2	7	8	$2\frac{5}{16}$
1	$7\frac{1}{8}$	5	$1\frac{1}{16}$	1	$11\frac{1}{8}$	6	$1\frac{5}{8}$	2	$3\frac{1}{8}$	7	$2\frac{3}{16}$	2	$7\frac{1}{8}$	8	$2\frac{3}{4}$
1	$7\frac{1}{4}$	5	$1\frac{7}{16}$	1	$11\frac{1}{4}$	6	2	2	$3\frac{1}{4}$	7	$2\frac{9}{16}$	2	$7\frac{1}{4}$	8	$3\frac{1}{8}$
1	$7\frac{3}{8}$	5	$1\frac{13}{16}$	1	$11\frac{3}{8}$	6	$2\frac{3}{8}$	2	$3\frac{3}{8}$	7	$2\frac{15}{16}$	2	$7\frac{3}{8}$	8	$3\frac{1}{2}$
1	$7\frac{1}{2}$	5	$2\frac{3}{16}$	1	$11\frac{1}{2}$	6	$2\frac{3}{4}$	2	$3\frac{1}{2}$	7	$3\frac{3}{8}$	2	$7\frac{1}{2}$	8	$3\frac{15}{16}$
1	$7\frac{5}{8}$	5	$2\frac{5}{8}$	1	$11\frac{5}{8}$	6	$3\frac{3}{16}$	2	$3\frac{5}{8}$	7	$3\frac{3}{4}$	2	$7\frac{5}{8}$	8	$4\frac{5}{16}$
1	$7\frac{3}{4}$	5	3	1	$11\frac{3}{4}$	6	$3\frac{9}{16}$	2	$3\frac{3}{4}$	7	$4\frac{1}{8}$	2	$7\frac{3}{4}$	8	$4\frac{11}{16}$
1	$7\frac{7}{8}$	5	$3\frac{3}{8}$	1	$11\frac{7}{8}$	6	$3\frac{15}{16}$	2	$3\frac{7}{8}$	7	$4\frac{1}{2}$	2	$7\frac{7}{8}$	8	$5\frac{1}{16}$
1	8	5	$3\frac{3}{4}$	2	0	6	$4\frac{3}{8}$	2	4	7	$4\frac{15}{16}$	2	8	8	$5\frac{1}{2}$
1	$8\frac{1}{8}$	5	$4\frac{3}{16}$	2	$0\frac{1}{8}$	6	$4\frac{3}{4}$	2	$4\frac{1}{8}$	7	$5\frac{5}{16}$	2	$8\frac{1}{8}$	8	$5\frac{7}{8}$
1	$8\frac{1}{4}$	5	$4\frac{9}{16}$	2	$0\frac{1}{4}$	6	$5\frac{1}{8}$	2	$4\frac{1}{4}$	7	$5\frac{11}{16}$	2	$8\frac{1}{4}$	8	$6\frac{1}{4}$
1	$8\frac{3}{8}$	5	$4\frac{15}{16}$	2	$0\frac{3}{8}$	6	$5\frac{9}{16}$	2	$4\frac{3}{8}$	7	$6\frac{1}{16}$	2	$8\frac{3}{8}$	8	$6\frac{11}{16}$
1	$8\frac{1}{2}$	5	$5\frac{3}{8}$	2	$0\frac{1}{2}$	6	$5\frac{15}{16}$	2	$4\frac{1}{2}$	7	$6\frac{1}{2}$	2	$8\frac{1}{2}$	8	$7\frac{1}{16}$
1	$8\frac{5}{8}$	5	$5\frac{3}{4}$	2	$0\frac{5}{8}$	6	$6\frac{5}{16}$	2	$4\frac{5}{8}$	7	$6\frac{7}{8}$	2	$8\frac{5}{8}$	8	$7\frac{7}{16}$
1	$8\frac{3}{4}$	5	$6\frac{1}{8}$	2	$0\frac{3}{4}$	6	$6\frac{11}{16}$	2	$4\frac{3}{4}$	7	$7\frac{1}{4}$	2	$8\frac{3}{4}$	8	$7\frac{13}{16}$
1	$8\frac{7}{8}$	5	$6\frac{9}{16}$	2	$0\frac{7}{8}$	6	$7\frac{1}{8}$	2	$4\frac{7}{8}$	7	$7\frac{5}{8}$	2	$8\frac{7}{8}$	8	$8\frac{1}{4}$

TABLE XXV.

FOR PIPE MAKING.—Thickness of $\frac{3}{8}$ Plate of an Inch.

Inside Diameter of Pipe.		Length Between Centres of Rivet Holes.		Inside Diameter of Pipe.		Length Between Centres of Rivet Holes.		Inside Diameter of Pipe.		Length Between Centres of Rivet Holes.		Inside Diameter of Pipe.		Length Between Centres of Rivet Holes.	
FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.
0	1	0	$4\frac{1}{4}$	0	5	1	$4\frac{7}{8}$	0	9	2	$5\frac{1}{2}$	1	1	3	6
0	$1\frac{1}{8}$	0	$4\frac{5}{8}$	0	$5\frac{1}{8}$	1	$5\frac{1}{4}$	0	$9\frac{1}{8}$	2	$5\frac{7}{8}$	1	$1\frac{1}{8}$	3	$6\frac{3}{8}$
0	$1\frac{1}{4}$	0	5	0	$5\frac{1}{4}$	1	$5\frac{5}{8}$	0	$9\frac{1}{4}$	2	$6\frac{1}{4}$	1	$1\frac{1}{4}$	3	$6\frac{3}{4}$
0	$1\frac{3}{8}$	0	$5\frac{3}{8}$	0	$5\frac{3}{8}$	1	6	0	$9\frac{3}{8}$	2	$6\frac{5}{8}$	1	$1\frac{3}{8}$	3	$7\frac{1}{8}$
0	$1\frac{1}{2}$	0	$5\frac{7}{8}$	0	$5\frac{1}{2}$	1	$6\frac{1}{2}$	0	$9\frac{1}{2}$	2	7	1	$1\frac{1}{2}$	3	$7\frac{5}{8}$
0	$1\frac{5}{8}$	0	$6\frac{1}{4}$	0	$5\frac{5}{8}$	1	$6\frac{7}{8}$	0	$9\frac{5}{8}$	2	$7\frac{3}{8}$	1	$1\frac{5}{8}$	3	8
0	$1\frac{3}{4}$	0	$6\frac{5}{8}$	0	$5\frac{3}{4}$	1	$7\frac{1}{4}$	0	$9\frac{3}{4}$	2	$7\frac{3}{4}$	1	$1\frac{3}{4}$	3	$8\frac{3}{8}$
0	$1\frac{7}{8}$	0	7	0	$5\frac{7}{8}$	1	$7\frac{5}{8}$	0	$9\frac{7}{8}$	2	$8\frac{1}{4}$	1	$1\frac{7}{8}$	3	$8\frac{3}{4}$
0	2	0	$7\frac{1}{2}$	0	6	1	8	0	10	2	$8\frac{5}{8}$	1	2	3	$9\frac{1}{8}$
0	$2\frac{1}{8}$	0	$7\frac{7}{8}$	0	$6\frac{1}{8}$	1	$8\frac{3}{8}$	0	$10\frac{1}{8}$	2	9	1	$2\frac{1}{8}$	3	$9\frac{1}{2}$
0	$2\frac{1}{4}$	0	$8\frac{1}{4}$	0	$6\frac{1}{4}$	1	$8\frac{3}{4}$	0	$10\frac{1}{4}$	2	$9\frac{3}{8}$	1	$2\frac{1}{4}$	3	$9\frac{7}{8}$
0	$2\frac{3}{8}$	0	$8\frac{5}{8}$	0	$6\frac{3}{8}$	1	$9\frac{1}{8}$	0	$10\frac{3}{8}$	2	$9\frac{3}{4}$	1	$2\frac{3}{8}$	3	$10\frac{3}{8}$
0	$2\frac{1}{2}$	0	9	0	$6\frac{1}{2}$	1	$9\frac{1}{2}$	0	$10\frac{1}{2}$	2	$10\frac{1}{8}$	1	$2\frac{1}{2}$	3	$10\frac{3}{4}$
0	$2\frac{5}{8}$	0	$9\frac{3}{8}$	0	$6\frac{5}{8}$	1	10	0	$10\frac{5}{8}$	2	$10\frac{1}{2}$	1	$2\frac{5}{8}$	3	$11\frac{1}{8}$
0	$2\frac{3}{4}$	0	$9\frac{3}{4}$	0	$6\frac{3}{4}$	1	$10\frac{3}{8}$	0	$10\frac{3}{4}$	2	$10\frac{7}{8}$	1	$2\frac{3}{4}$	3	$11\frac{1}{2}$
0	$2\frac{7}{8}$	0	$10\frac{1}{4}$	0	$6\frac{7}{8}$	1	$10\frac{3}{4}$	0	$10\frac{7}{8}$	2	$11\frac{3}{8}$	1	$2\frac{7}{8}$	3	$11\frac{7}{8}$
0	3	0	$10\frac{1}{2}$	0	7	1	$11\frac{1}{8}$	0	11	2	$11\frac{3}{4}$	1	3	4	$0\frac{1}{4}$
0	$3\frac{1}{8}$	0	11	0	$7\frac{1}{8}$	1	$11\frac{1}{2}$	0	$11\frac{1}{8}$	3	$0\frac{1}{8}$	1	$3\frac{1}{8}$	4	$0\frac{5}{8}$
0	$3\frac{1}{4}$	0	$11\frac{3}{8}$	0	$7\frac{1}{4}$	1	$11\frac{7}{8}$	0	$11\frac{1}{4}$	3	$0\frac{1}{2}$	1	$3\frac{1}{4}$	4	1
0	$3\frac{3}{8}$	0	$11\frac{3}{4}$	0	$7\frac{3}{8}$	2	$0\frac{3}{8}$	0	$11\frac{3}{8}$	3	$0\frac{7}{8}$	1	$3\frac{3}{8}$	4	$1\frac{3}{8}$
0	$3\frac{1}{2}$	1	$0\frac{1}{8}$	0	$7\frac{1}{2}$	2	$0\frac{3}{4}$	0	$11\frac{1}{2}$	3	$1\frac{1}{4}$	1	$3\frac{1}{2}$	4	$1\frac{7}{8}$
0	$3\frac{5}{8}$	1	$0\frac{1}{2}$	0	$7\frac{5}{8}$	2	$1\frac{1}{8}$	0	$11\frac{5}{8}$	3	$1\frac{5}{8}$	1	$3\frac{5}{8}$	4	$2\frac{1}{4}$
0	$3\frac{3}{4}$	1	$0\frac{7}{8}$	0	$7\frac{3}{4}$	2	$1\frac{1}{2}$	0	$11\frac{3}{4}$	3	2	1	$3\frac{3}{4}$	4	$2\frac{5}{8}$
0	$3\frac{7}{8}$	1	$1\frac{3}{8}$	0	$7\frac{7}{8}$	2	$1\frac{7}{8}$	0	$11\frac{7}{8}$	3	$2\frac{1}{2}$	1	$3\frac{7}{8}$	4	3
0	4	1	$1\frac{3}{4}$	0	8	2	$2\frac{3}{8}$	1	0	3	$2\frac{7}{8}$	1	4	4	$3\frac{3}{8}$
0	$4\frac{1}{8}$	1	$2\frac{1}{8}$	0	$8\frac{1}{8}$	2	$2\frac{3}{4}$	1	$0\frac{1}{8}$	3	$3\frac{1}{4}$	1	$4\frac{1}{8}$	4	$3\frac{3}{4}$
0	$4\frac{1}{4}$	1	$2\frac{1}{2}$	0	$8\frac{1}{4}$	2	$3\frac{1}{8}$	1	$0\frac{1}{4}$	3	$3\frac{5}{8}$	1	$4\frac{1}{4}$	4	$4\frac{1}{8}$
0	$4\frac{3}{8}$	1	$2\frac{7}{8}$	0	$8\frac{3}{8}$	2	$3\frac{1}{2}$	1	$0\frac{3}{8}$	3	4	1	$4\frac{3}{8}$	4	$4\frac{1}{2}$
0	$4\frac{1}{2}$	1	$3\frac{1}{4}$	0	$8\frac{1}{2}$	2	$3\frac{7}{8}$	1	$0\frac{1}{2}$	3	$4\frac{3}{8}$	1	$4\frac{1}{2}$	4	5
0	$4\frac{5}{8}$	1	$3\frac{5}{8}$	0	$8\frac{5}{8}$	2	$4\frac{1}{4}$	1	$0\frac{5}{8}$	3	$4\frac{7}{8}$	1	$4\frac{5}{8}$	4	$5\frac{3}{8}$
0	$4\frac{3}{4}$	1	4	0	$8\frac{3}{4}$	2	$4\frac{5}{8}$	1	$0\frac{3}{4}$	3	$5\frac{1}{4}$	1	$4\frac{3}{4}$	4	$5\frac{3}{4}$
0	$4\frac{7}{8}$	1	$4\frac{1}{2}$	0	$8\frac{7}{8}$	2	5	1	$0\frac{7}{8}$	3	$5\frac{5}{8}$	1	$4\frac{7}{8}$	4	$6\frac{1}{8}$

FOR PIPE MAKING.—Thickness of Plate $\frac{3}{8}$ of an Inch.

Inside Diameter of Pipe.		Length Between Centres of Rivet Holes.		Inside Diameter of Pipe.		Length Between Centres of Rivet Holes.		Inside Diameter of Pipe.		Length Between Centres of Rivet Holes.		Inside Diameter of Pipe.		Length Between Centres of Rivet Holes.	
FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN	FT.	IN.	FT.	IN.	FT.	IN.
1	5	4	6½	1	9	5	7⅛	2	1	6	7⅝	2	5	7	8¼
1	5⅛	4	7	1	9⅛	5	7½	2	1⅛	6	8⅛	2	5⅛	7	8⅝
1	5¼	4	7⅜	1	9¼	5	8	2	1¼	6	8½	2	5¼	7	9
1	5⅜	4	7¾	1	9⅜	5	8⅜	2	1⅜	6	8⅞	2	5⅜	7	9⅜
1	5½	4	8⅛	1	9½	5	8¾	2	1½	6	9¼	2	5½	7	9¾
1	5⅝	4	8½	1	9⅝	5	9⅛	2	1⅝	6	9⅝	2	5⅝	7	10¼
1	5¾	4	8⅞	1	9¾	5	9½	2	1¾	6	10	2	5¾	7	10⅝
1	5⅞	4	9¼	1	9⅞	5	9⅞	2	1⅞	6	10½	2	5⅞	7	11
1	6	4	9⅝	1	10	5	10¼	2	2	6	10⅞	2	6	7	11⅜
1	6⅛	4	10⅛	1	10⅛	5	10⅝	2	2⅛	6	11¼	2	6⅛	7	11¾
1	6¼	4	10½	1	10¼	5	11	2	2¼	6	11⅝	2	6¼	8	0⅛
1	6⅜	4	10⅞	1	10⅜	5	11½	2	2⅜	7	0	2	6⅜	8	0½
1	6½	4	11¼	1	10½	5	11⅞	2	2½	7	0⅜	2	6½	8	1
1	6⅝	4	11⅝	1	10⅝	6	0¼	2	2⅝	7	0¾	2	6⅝	8	1⅜
1	6¾	5	0	1	10¾	6	0⅝	2	2¾	7	1⅛	2	6¾	8	1¾
1	6⅞	5	0⅜	1	10⅞	6	1	2	2⅞	7	1½	2	6⅞	8	2⅛
1	7	5	0⅞	1	11	6	1⅜	2	3	7	2	2	7	8	2½
1	7⅛	5	1¼	1	11⅛	6	1¾	2	3⅛	7	2⅜	2	7⅛	8	2⅞
1	7¼	5	1⅝	1	11¼	6	2¼	2	3¼	7	2¾	2	7¼	8	3⅜
1	7⅜	5	2	1	11⅜	6	2⅝	2	3⅜	7	3⅛	2	7⅜	8	3¾
1	7½	5	2⅜	1	11½	6	3	2	3½	7	3½	2	7½	8	4⅛
1	7⅝	5	2¾	1	11⅝	6	3⅜	2	3⅝	7	3⅞	2	7⅝	8	4½
1	7¾	5	3⅛	1	11¾	6	3¾	2	3¾	7	4⅜	2	7¾	8	4⅞
1	7⅞	5	3⅝	1	11⅞	6	4⅛	2	3⅞	7	4¾	2	7⅞	8	5¼
1	8	5	4	2	0	6	4½	2	4	7	5⅛	2	8	8	5⅝
1	8⅛	5	4⅜	2	0⅛	6	4⅞	2	4⅛	7	5½	2	8⅛	8	6
1	8¼	5	4¾	2	0¼	6	5⅜	2	4¼	7	5⅞	2	8¼	8	6½
1	8⅜	5	5⅛	2	0⅜	6	5¾	2	4⅜	7	6¼	2	8⅜	8	6⅞
1	8½	5	5½	2	0½	6	6⅛	2	4½	7	6⅝	2	8½	8	7¼
1	8⅝	5	5⅞	2	0⅝	6	6½	2	4⅝	7	7	2	8⅝	8	7⅝
1	8¾	5	6⅜	2	0¾	6	6⅞	2	4¾	7	7½	2	8¾	8	8
1	8⅞	5	6¾	2	0⅞	6	7¼	2	4⅞	7	7⅞	2	8⅞	8	8⅜

THE BOILER-MAKERS'

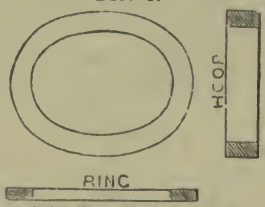
AND

IRON SHIP-BUILDERS' COMPANION

SECTION IV.

Tables of Diameters and Circumferences for the formation of Plain Hoops and Rings.

FIG. 1.



RULE 1.—Add the thickness of iron to the given inside diameter of hoop, for a new diameter, then refer to the table for the circumference or lengths required.

EXAMPLE.—What length of iron ¾ of an inch thick will form a hoop, whose inside diameter equals 5 feet 10 inches? To 5 feet 10 inches add ¾ of an inch, which will make 5 feet 10¾ inches, the new diameter. In table 26, page 135, opposite 5 ft. 10¾ in. diameter, is 18 feet 6¼ inches, the circumference or length required.

RULE 2.—Add the breadth of iron to the given inside diameter of ring, for a new diameter, then refer to the table for the circumference or length required.

EXAMPLE.—What length of iron 3 inches wide will form a ring, the inside diameter being 2 feet 6 inches? To 2 feet 6 inches, add 3 inches, which will make 2 feet 9 inches, the new diameter. In table 26, page 133, opposite 2 feet 9 inches diameter, is 8 ft. 7⅝ in., the circumference or length required.

OVAL HOOPS AND RINGS.

RULE 3.—Take half the sum of the given inside axis as a diameter, then add the thickness or breadth of the iron as may be required for a hoop or ring for a new diameter, and in the table of diameters and circumferences the required length will be found.

EXAMPLE.—Required, the circumference of an oval hoop, whose inside axis are 1 foot 6 inches, and 1 foot $1\frac{1}{2}$ inches, the thickness of iron being $\frac{1}{2}$ inch.

	1 foot 6 inches.		
	1 ,, $1\frac{1}{2}$,,		
2	2 ,, $7\frac{1}{2}$,,		
	1 ,, $3\frac{3}{4}$,,		
	$\frac{1}{2}$,,	thickness of iron.	
	1 ,, $4\frac{1}{4}$,,	diameter required.	

In table 26, page 131, opposite 1 foot $4\frac{1}{4}$ inches diameter, is 4 feet 3 inches, the circumference or length required.

Required, the circumference of an oval ring, whose inside axis are 1 foot 6 inches, and 1 foot $1\frac{1}{2}$ inch, the breadth of iron being $2\frac{1}{2}$ inches.

	1 foot 6 inches.	
	1 ,, $1\frac{1}{2}$,,	
2	2 ,, $7\frac{1}{2}$,,	
	1 ,, $3\frac{3}{4}$,,	
	$2\frac{1}{4}$,,	thickness of iron.
	1 ,, $6\frac{1}{4}$,,	diameter required.

In table 26, page 132, opposite 1 foot $6\frac{1}{4}$ inches diameter, is 4 feet $9\frac{1}{4}$ inches, the circumference or length required.

NOTE.—In the tables of lengths for hoops and rings, whether plain or angled, no allowance is made for welding or shutting.

TABLE XXVI.

DIAMETERS AND CIRCUMFERENCES.

DIAMETER	CIRCUMFERENCE	DIAMETER	CIRCUMFERENCE	DIAMETER	CIRCUMFERENCE.	DIAMETER	CIRCUMFERENCE
IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
$\frac{1}{32}$	·0981	$\frac{4}{16}$	·7854	$\frac{8}{16}$	1·5708	$\frac{12}{16}$	2·3562
$\frac{1}{16}$	·1963	$\frac{5}{16}$	·9817	$\frac{9}{16}$	1·7671	$\frac{13}{16}$	2·5525
$\frac{3}{16}$	·3927	$\frac{6}{16}$	1·1781	$\frac{10}{16}$	1·9635	$\frac{14}{16}$	2·7489
$\frac{1}{8}$	·5890	$\frac{7}{16}$	1·3744	$\frac{11}{16}$	2·1593	$\frac{15}{16}$	2·9452

DIAMETERS AND CIRCUMFERENCES.

DIAMETER		CIRCUMFERENCE		DIAMETER		CIRCUMFERENCE		DIAMETER		CIRCUMFERENCE.		DIAMETER		CIRCUMFERENCE	
FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN	FT.	IN.	FT.	IN.	FT.	IN.
0	1	0	3 1/8	0	5	1	3 5/8	0	9	2	4 1/4	1	1	3	4 7/8
0	1 1/8	0	3 1/2	0	5 1/8	1	4	0	9 1/8	2	4 5/8	1	1 1/8	3	5 1/4
0	1 1/4	0	3 7/8	0	5 1/4	1	4 1/2	0	9 1/4	2	5	1	1 1/4	3	5 5/8
0	1 3/8	0	4 1/4	0	5 3/8	1	4 7/8	0	9 3/8	2	5 1/2	1	1 3/8	3	6
0	1 1/2	0	4 5/8	0	5 1/2	1	5 1/4	0	9 1/2	2	5 7/8	1	1 1/2	3	6 3/8
0	1 5/8	0	5	0	5 5/8	1	5 5/8	0	9 5/8	2	6 1/4	1	1 5/8	3	6 3/4
0	1 3/4	0	5 3/8	0	5 3/4	1	6	0	9 3/4	2	6 5/8	1	1 3/4	3	7 1/8
0	1 7/8	0	5 7/8	0	5 7/8	1	6 1/2	0	9 7/8	2	7	1	1 7/8	3	7 5/8
0	2	0	6 1/4	0	6	1	6 7/8	0	10	2	7 3/8	1	2	3	8
0	2 1/8	0	6 5/8	0	6 1/8	1	7 1/4	0	10 1/8	2	7 3/4	1	2 1/8	3	8 3/8
0	2 1/4	0	7	0	6 1/4	1	7 5/8	0	10 1/4	2	8 1/4	1	2 1/4	3	8 3/4
0	2 3/8	0	7 1/4	0	6 3/8	1	8	0	10 3/8	2	8 5/8	1	2 3/8	3	9 1/8
0	2 1/2	0	7 7/8	0	6 1/2	1	8 3/8	0	10 1/2	2	9	1	2 1/2	3	9 1/2
0	2 5/8	0	8 1/4	0	6 5/8	1	8 3/4	0	10 5/8	2	9 3/8	1	2 5/8	3	9 7/8
0	2 3/4	0	8 5/8	0	6 3/4	1	9 1/8	0	10 3/4	2	9 3/4	1	2 3/4	3	10 3/8
0	2 7/8	0	9	0	6 7/8	1	9 1/2	0	10 7/8	2	10 1/8	1	2 7/8	3	10 3/4
0	3	0	9 3/8	0	7	1	10	0	11	2	10 1/2	1	3	3	11 1/8
0	3 1/8	0	9 3/4	0	7 1/8	1	10 3/8	0	11 1/8	2	10 7/8	1	3 1/8	3	11 1/2
0	3 1/4	0	10 1/8	0	7 1/4	1	10 3/4	0	11 1/4	2	11 3/8	1	3 1/4	3	11 7/8
0	3 3/8	0	10 1/2	0	7 3/8	1	11 1/8	0	11 3/8	2	11 3/4	1	3 3/8	4	0 1/4
0	3 1/2	0	11	0	7 1/2	1	11 1/2	0	11 1/2	3	0 1/8	1	3 1/2	4	0 5/8
0	3 5/8	0	11 3/8	0	7 5/8	1	11 7/8	0	11 5/8	3	0 1/2	1	3 5/8	4	1
0	3 3/4	0	11 3/4	0	7 3/4	2	0 3/8	0	11 3/4	3	0 7/8	1	3 3/4	4	1 3/8
0	3 7/8	1	0 1/8	0	7 7/8	2	0 3/4	0	11 7/8	3	1 1/4	1	3 7/8	4	1 7/8
0	4	1	0 1/2	0	8	2	1 1/8	1	0	3	1 5/8	1	4	4	2 1/4
0	4 1/8	1	0 7/8	0	8 1/8	2	1 1/2	1	0 1/8	3	2	1	4 1/8	4	2 5/8
0	4 1/4	1	1 3/8	0	8 1/4	2	1 7/8	1	0 1/4	3	2 1/2	1	4 1/4	4	3
0	4 3/8	1	1 3/4	0	8 3/8	2	2 3/8	1	0 3/8	3	2 7/8	1	4 3/8	4	3 3/8
0	4 1/2	1	2 1/8	0	8 1/2	2	2 3/4	1	0 1/2	3	3 1/4	1	4 1/2	4	3 3/4
0	4 5/8	1	2 1/2	0	8 5/8	2	3 1/8	1	0 5/8	3	3 5/8	1	4 5/8	4	4 1/8
0	4 3/4	1	2 7/8	0	8 3/4	2	3 1/2	1	0 3/4	3	4	1	4 3/4	4	4 1/2
0	4 7/8	1	3 1/4	0	8 7/8	2	3 7/8	1	0 7/8	3	4 3/8	1	4 7/8	4	5

DIAMETERS AND CIRCUMFERENCES.

DIAMETER		CIRCUMFERENCE		DIAMETER		CIRCUMFERENCE		DIAMETER		CIRCUMFERENCE.		DIAMETER		CIRCUMFERENCE	
FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN	FT.	IN.	FT.	IN.	FT.	IN.
1	5	4	5 3/8	1	9	5	5 7/8	2	1	6	6 1/2	2	5	7	7
1	5 1/8	4	5 3/4	1	9 1/8	5	6 3/8	2	1 1/8	6	6 7/8	2	5 1/8	7	7 1/2
1	5 1/4	4	6 1/8	1	9 1/4	5	6 3/4	2	1 1/4	6	7 1/4	2	5 1/4	7	7 7/8
1	5 3/8	4	6 1/2	1	9 3/8	5	7 1/8	2	1 3/8	6	7 5/8	2	5 3/8	7	8 1/4
1	5 1/2	4	7	1	9 1/2	5	7 1/2	2	1 1/2	6	8 1/8	2	5 1/2	7	8 5/8
1	5 5/8	4	7 3/8	1	9 5/8	5	8	2	1 5/8	6	8 1/2	2	5 5/8	7	9
1	5 3/4	4	7 3/4	1	9 3/4	5	8 3/8	2	1 3/4	6	8 7/8	2	5 3/4	7	9 3/8
1	5 7/8	4	8 1/8	1	9 7/8	5	8 3/4	2	1 7/8	6	9 1/4	2	5 7/8	7	9 3/4
1	6	4	8 1/2	1	10	5	9 1/8	2	2	6	9 5/8	2	6	7	10 1/4
1	6 1/8	4	8 7/8	1	10 1/8	5	9 1/2	2	2 1/8	6	10	2	6 1/8	7	10 5/8
1	6 1/4	4	9 1/4	1	10 1/4	5	9 7/8	2	2 1/4	6	10 1/2	2	6 1/4	7	11
1	6 3/8	4	9 5/8	1	10 3/8	5	10 1/4	2	2 3/8	6	10 7/8	2	6 3/8	7	11 3/8
1	6 1/2	4	10 1/8	1	10 1/2	5	10 5/8	2	2 1/2	6	11 1/4	2	6 1/2	7	11 3/4
1	6 5/8	4	10 1/2	1	10 5/8	5	11	2	2 5/8	6	11 5/8	2	6 5/8	8	0 1/8
1	6 3/4	4	10 7/8	1	10 3/4	5	11 1/2	2	2 3/4	7	0	2	6 3/4	8	0 1/2
1	6 7/8	4	11 1/4	1	10 7/8	5	11 7/8	2	2 7/8	7	0 3/8	2	6 7/8	8	1
1	7	4	11 5/8	1	11	6	0 1/4	2	3	7	0 3/4	2	7	8	1 3/8
1	7 1/8	5	0	1	11 1/8	6	0 5/8	2	3 1/8	7	1 1/8	2	7 1/8	8	1 3/4
1	7 1/4	5	0 3/8	1	11 1/4	6	1	2	3 1/4	7	1 1/2	2	7 1/4	8	2 1/8
1	7 3/8	5	0 7/8	1	11 3/8	6	1 3/8	2	3 3/8	7	2	2	7 3/8	8	2 1/2
1	7 1/2	5	1 1/4	1	11 1/2	6	1 3/4	2	3 1/2	7	2 3/8	2	7 1/2	8	2 7/8
1	7 5/8	5	1 5/8	1	11 5/8	6	2 1/4	2	3 5/8	7	2 3/4	2	7 5/8	8	3 3/8
1	7 3/4	5	2	1	11 3/4	6	2 5/8	2	3 3/4	7	3 1/8	2	7 3/4	8	3 3/4
1	7 7/8	5	2 3/8	1	11 7/8	6	3	2	3 7/8	7	3 1/2	2	7 7/8	8	4 1/8
1	8	5	2 3/4	2	0	6	3 3/8	2	4	7	3 7/8	2	8	8	4 1/2
1	8 1/8	5	3 1/8	2	0 1/8	6	3 3/4	2	4 1/8	7	4 3/8	2	8 1/8	8	4 7/8
1	8 1/4	5	3 5/8	2	0 1/4	6	4 1/8	2	4 1/4	7	4 3/4	2	8 1/4	8	5 1/4
1	8 3/8	5	4	2	0 3/8	6	4 1/2	2	4 3/8	7	5 1/8	2	8 3/8	8	5 5/8
1	8 1/2	5	4 3/8	2	0 1/2	6	4 7/8	2	4 1/2	7	5 1/2	2	8 1/2	8	6
1	8 5/8	5	4 3/4	2	0 5/8	6	5 3/8	2	4 5/8	7	5 7/8	2	8 5/8	8	6 1/2
1	8 3/4	5	5 1/8	2	0 3/4	6	5 3/4	2	4 3/4	7	6 1/4	2	8 3/4	8	6 7/8
1	8 7/8	5	5 1/2	2	0 7/8	6	6 1/8	2	4 7/8	7	6 5/8	2	8 7/8	8	7 1/4

DIAMETERS AND CIRCUMFERENCES.

DIAMETER.		CIRCUMFERENCE		DIAMETER		CIRCUMFERENCE		DIAMETER		CIRCUMFERENCE.		DIAMETER		CIRCUMFERENCE	
FT.	IN.	FT.	IN	FT.	IN	FT.	IN.	FT.	IN	FT.	IN.	FT.	IN.	FT.	IN
2	9	8	7 5/8	3	1	9	8 1/4	3	5	10	8 3/4	3	9	11	9 3/8
2	9 1/8	8	8	3	1 1/8	9	8 5/8	3	5 1/8	10	9 1/8	3	9 1/8	11	9 3/4
2	9 1/4	8	8 3/8	3	1 1/4	9	9	3	5 1/4	10	9 1/4	3	9 1/4	11	10 1/8
2	9 3/8	8	8 7/8	3	1 3/8	9	9 3/8	3	5 3/8	10	9 7/8	3	9 3/8	11	10 1/2
2	9 1/2	8	9 1/4	3	1 1/2	9	9 3/4	3	5 1/2	10	10 3/8	3	9 1/2	11	10 7/8
2	9 5/8	8	9 5/8	3	1 5/8	9	10 1/8	3	5 5/8	10	10 3/4	3	9 5/8	11	11 1/4
2	9 3/4	8	10	3	1 3/4	9	10 1/2	3	5 3/4	10	11 1/8	3	9 3/4	11	11 5/8
2	9 7/8	8	10 3/8	3	1 7/8	9	10 7/8	3	5 7/8	10	11 1/2	3	9 7/8	12	0 1/8
2	10	8	10 3/4	3	2	9	11 3/8	3	6	10	11 7/8	3	10	12	0 1/2
2	10 1/8	8	11 1/8	3	2 1/8	9	11 3/4	3	6 1/8	11	0 3/8	3	10 1/8	12	0 7/8
2	10 1/4	8	11 1/2	3	2 1/4	10	0 1/8	3	6 1/4	11	0 3/4	3	10 1/4	12	1 1/4
2	10 3/8	9	0	3	2 3/8	10	0 1/2	3	6 3/8	11	1 1/8	3	10 3/8	12	1 5/8
2	10 1/2	9	0 3/8	3	2 1/2	10	0 7/8	3	6 1/2	11	1 1/2	3	10 1/2	12	2
2	10 5/8	9	0 3/4	3	2 5/8	10	1 3/8	3	6 5/8	11	1 7/8	3	10 5/8	12	2 3/8
2	10 3/4	9	1 1/8	3	2 3/4	10	1 3/4	3	6 3/4	11	2 1/4	3	10 3/4	12	2 7/8
2	10 7/8	9	1 1/2	3	2 7/8	10	2 1/8	3	6 7/8	11	2 5/8	3	10 7/8	12	3 1/4
2	11	9	1 7/8	3	3	10	2 1/2	3	7	11	3	3	11	12	3 5/8
2	11 1/8	9	2 3/8	3	3 1/8	10	2 7/8	3	7 1/8	11	3 1/2	3	11 1/8	12	4
2	11 1/4	9	2 3/4	3	3 1/4	10	3 1/4	3	7 1/4	11	3 7/8	3	11 1/4	12	4 3/8
2	11 3/8	9	3 1/8	3	3 3/8	10	3 5/8	3	7 3/8	11	4 1/4	3	11 3/8	12	4 3/4
2	11 1/2	9	3 1/2	3	3 1/2	10	4	3	7 1/2	11	4 5/8	3	11 1/2	12	5 1/4
2	11 5/8	9	3 7/8	3	3 5/8	10	4 1/2	3	7 5/8	11	5	3	11 5/8	12	5 5/8
2	11 3/4	9	4 1/4	3	3 3/4	10	4 7/8	3	7 3/4	11	5 3/8	3	11 3/4	12	6
2	11 7/8	9	4 5/8	3	3 7/8	10	5 1/4	3	7 7/8	11	5 3/4	3	11 7/8	12	6 3/8
3	0	9	5	3	4	10	5 5/8	3	8	11	6 1/4	4	0	12	6 3/4
3	0 1/8	9	5 1/2	3	4 1/8	10	6	3	8 1/8	11	6 5/8	4	0 1/8	12	7 1/8
3	0 1/4	9	5 7/8	3	4 1/4	10	6 3/8	3	8 1/4	11	7	4	0 1/4	12	7 1/2
3	0 3/8	9	6 1/4	3	4 3/8	10	6 7/8	3	8 3/8	11	7 3/8	4	0 3/8	12	7 7/8
3	0 1/2	9	6 5/8	3	4 1/2	10	7 1/4	3	8 1/2	11	7 3/4	4	0 1/2	12	8 3/8
3	0 5/8	9	7	3	4 5/8	10	7 5/8	3	8 5/8	11	8 1/8	4	0 5/8	12	8 3/4
3	0 3/4	9	7 3/8	3	4 3/4	10	8	3	8 3/4	11	8 1/2	4	0 3/4	12	9 1/8
3	0 7/8	9	7 7/8	3	4 7/8	10	8 3/8	3	8 7/8	11	8 7/8	4	0 7/8	12	9 1/2

DIAMETERS AND CIRCUMFERENCES.

DIAMETER		CIRCUMFERENCE		DIAMETER		CIRCUMFERENCE		DIAMETER		CIRCUMFERENCE.		DIAMETER		CIRCUMFERENCE	
FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.
4	1	12	9 7/8	4	5	13	10 1/2	4	9	14	11	5	1	15	11 5/8
4	1 1/8	12	10 3/8	4	5 1/8	13	10 7/8	4	9 1/8	14	11 1/2	5	1 1/8	16	0
4	1 1/4	12	10 3/4	4	5 1/4	13	11 1/4	4	9 1/4	14	11 7/8	5	1 1/4	16	0 3/8
4	1 3/8	12	11 1/8	4	5 3/8	13	11 5/8	4	9 3/8	15	0 1/4	5	1 3/8	16	0 3/4
4	1 1/2	12	11 1/2	4	5 1/2	14	0	4	9 1/2	15	0 5/8	5	1 1/2	16	1 1/8
4	1 5/8	12	11 7/8	4	5 5/8	14	0 3/8	4	9 5/8	15	1	5	1 5/8	16	1 5/8
4	1 3/4	13	0 1/4	4	5 3/4	14	0 7/8	4	9 3/4	15	1 3/8	5	1 3/4	16	2
4	1 7/8	13	0 5/8	4	5 7/8	14	1 1/4	4	9 7/8	15	1 7/8	5	1 7/8	16	2 3/8
4	2	13	1	4	6	14	1 5/8	4	10	15	2 1/4	5	2	16	2 3/4
4	2 1/8	13	1 1/2	4	6 1/8	14	2	4	10 1/8	15	2 5/8	5	2 1/8	16	3 1/8
4	2 1/4	13	1 7/8	4	6 1/4	14	2 3/8	4	10 1/4	15	3	5	2 1/4	16	3 1/2
4	2 3/8	13	2 1/4	4	6 3/8	14	2 3/4	4	10 3/8	15	3 3/8	5	2 3/8	16	3 7/8
4	2 1/2	13	2 5/8	4	6 1/2	14	3 1/8	4	10 1/2	15	3 3/4	5	2 1/2	16	4 3/8
4	2 5/8	13	3	4	6 5/8	14	3 1/2	4	10 5/8	15	4 1/8	5	2 5/8	16	4 3/4
4	2 3/4	13	3 3/8	4	6 3/4	14	4	4	10 3/4	15	4 1/2	5	2 3/4	16	5 1/8
4	2 7/8	13	3 3/4	4	6 7/8	14	4 3/8	4	10 7/8	15	4 7/8	5	2 7/8	16	5 1/2
4	3	13	4 1/4	4	7	14	4 3/4	4	11	15	5 3/8	5	3	16	5 7/8
4	3 1/8	13	4 5/8	4	7 1/8	14	5 1/8	4	11 1/8	15	5 3/4	5	3 1/8	16	6 1/4
4	3 1/4	13	5	4	7 1/4	14	5 1/2	4	11 1/4	15	6 1/8	5	3 1/4	16	6 5/8
4	3 3/8	13	5 3/8	4	7 3/8	14	5 7/8	4	11 3/8	15	6 1/2	5	3 3/8	16	7
4	3 1/2	13	5 3/4	4	7 1/2	14	6 3/8	4	11 1/2	15	6 7/8	5	3 1/2	16	7 1/2
4	3 5/8	13	6 1/8	4	7 5/8	14	6 3/4	4	11 5/8	15	7 1/4	5	3 5/8	16	7 7/8
4	3 3/4	13	6 1/2	4	7 3/4	14	7 1/8	4	11 3/4	15	7 3/4	5	3 3/4	16	8 1/4
4	3 7/8	13	7	4	7 7/8	14	7 1/2	4	11 7/8	15	8 1/8	5	3 7/8	16	8 5/8
4	4	13	7 3/8	4	8	14	7 7/8	5	0	15	8 1/2	5	4	16	9
4	4 1/8	13	7 3/4	4	8 1/8	14	8 1/4	5	0 1/8	15	8 7/8	5	4 1/8	16	9 3/8
4	4 1/4	13	8 1/8	4	8 1/4	14	8 3/4	5	0 1/4	15	9 1/4	5	4 1/4	16	9 7/8
4	4 3/8	13	8 1/2	4	8 3/8	14	9 1/8	5	0 3/8	15	9 5/8	5	4 3/8	16	10 1/4
4	4 1/2	13	8 7/8	4	8 1/2	14	9 1/2	5	0 1/2	15	10	5	4 1/2	16	10 5/8
4	4 5/8	13	9 1/4	4	8 5/8	14	9 7/8	5	0 5/8	15	10 3/8	5	4 5/8	16	11
4	4 3/4	13	9 5/8	4	8 3/4	14	10 1/4	5	0 3/4	15	10 7/8	5	4 3/4	16	11 3/8
4	4 7/8	13	10 1/8	4	8 7/8	14	10 3/8	5	0 7/8	15	11 1/4	5	4 7/8	16	11 3/4

DIAMETERS AND CIRCUMFERENCES.

DIAMETER		CIRCUMFERENCE		DIAMETER		CIRCUMFERENCE		DIAMETER		CIRCUMFERENCE.		DIAMETER		CIRCUMFERENCE	
FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN	FT.	IN.	FT.	IN.	FT.	IN.
5	5	17	0⅛	5	9	18	0¾	6	1	19	1⅜	6	5	20	1⅞
5	5⅛	17	0⅝	5	9⅛	18	1⅛	6	1⅛	19	1¾	6	5⅛	20	2¼
5	5¼	17	1	5	9¼	18	1½	6	1¼	19	2⅛	6	5¼	20	2⅝
5	5⅜	17	1⅜	5	9⅜	18	1⅞	6	1⅜	19	2¼	6	5⅜	20	3
5	5½	17	1¾	5	9½	18	2⅜	6	1½	19	2⅞	6	5½	20	3½
5	5⅝	17	2⅛	5	9⅝	18	2¾	6	1⅝	19	3¼	6	5⅝	20	3⅞
5	5¾	17	2½	5	9¾	18	3⅛	6	1¾	19	3⅝	6	5¾	20	4¼
5	5⅞	17	2⅞	5	9⅞	18	3½	6	1⅞	19	4	6	5⅞	20	4⅝
5	6	17	3⅜	5	10	18	3⅞	6	2	19	4½	6	6	20	5
5	6⅛	17	3¾	5	10⅛	18	4¼	6	2⅛	19	4⅞	6	6⅛	20	5⅜
5	6¼	17	4⅛	5	10¼	18	4⅝	6	2¼	19	5¼	6	6¼	20	5⅞
5	6⅜	17	4½	5	10⅜	18	5	6	2⅜	19	5⅝	6	6⅜	20	6¼
5	6½	17	4⅞	5	10½	18	5½	6	2½	19	6	6	6½	20	6⅝
5	6⅝	17	5¼	5	10⅝	18	5⅞	6	2⅝	19	6⅜	6	6⅝	20	7
5	6¾	17	5⅝	5	10¾	18	6¼	6	2¾	19	6⅞	6	6¾	20	7⅜
5	6⅞	17	6	5	10⅞	18	6⅝	6	2⅞	19	7¼	6	6⅞	20	7¾
5	7	17	6½	5	11	18	7	6	3	19	7⅝	6	7	20	8⅛
5	7⅛	17	6⅞	5	11⅛	18	7⅜	6	3⅛	19	8	6	7⅛	20	8½
5	7¼	17	7¼	5	11¼	18	7¾	6	3¼	19	8⅜	6	7¼	20	9
5	7⅜	17	7⅝	5	11⅜	18	8¼	6	3⅜	19	8¾	6	7⅜	20	9⅜
5	7½	17	8	5	11½	18	8⅝	6	3½	19	9⅛	6	7½	20	9¾
5	7⅝	17	8⅜	5	11⅝	18	9	6	3⅝	19	9⅝	6	7⅝	20	10⅛
5	7¾	17	8⅞	5	11¾	18	9⅜	6	3¾	19	10	6	7¾	20	10½
5	7⅞	17	9¼	5	11⅞	18	9¾	6	3⅞	19	10⅜	6	7⅞	20	10⅞
5	8	17	9⅝	6	0	18	10⅛	6	4	19	10¾	6	8	20	11⅜
5	8⅛	17	10	6	0⅛	18	10½	6	4⅛	19	11⅛	6	8⅛	20	11¾
5	8¼	17	10⅜	6	0¼	18	11	6	4¼	19	11½	6	8¼	21	0⅛
5	8⅜	17	10¾	6	0⅜	18	11⅜	6	4⅜	19	11⅞	6	8⅜	21	0½
5	8½	17	11⅛	6	0½	18	11¾	6	4½	20	0⅜	6	8½	21	0⅞
5	8⅝	17	11½	6	0⅝	19	0⅛	6	4⅝	20	0¾	6	8⅝	21	1¼
5	8¾	18	0	6	0¾	19	0½	6	4¾	20	1⅛	6	8¾	21	1⅝
5	8⅞	18	0⅜	6	0⅞	19	0⅞	6	4⅞	20	1½	6	8⅞	21	2

DIAMETERS AND CIRCUMFERENCES.

DIAMETER		CIRCUMFERENCE		DIAMETER		CIRCUMFERENCE		DIAMETER		CIRCUMFERENCE.		DIAMETER		CIRCUMFERENCE	
FT.	IN.	FT.	IN.	FT.	IN	FT.	IN.	FT.	IN	FT.	IN.	FT.	IN.	FT.	IN.
6	9	21	2½	7	1	22	3	7	5	23	3⅝	7	9	24	4⅛
6	9⅛	21	2⅞	7	1⅛	22	3⅜	7	5⅛	23	4	7	9⅛	24	4½
6	9¼	21	3¼	7	1¼	22	3⅞	7	5¼	23	4⅜	7	9¼	24	4⅞
6	9⅜	21	3⅝	7	1⅜	22	4¼	7	5⅜	23	4¾	7	9⅜	24	5⅜
6	9½	21	4	7	1½	22	4⅝	7	5½	23	5⅛	7	9½	24	5¾
6	9⅝	21	4⅜	7	1⅝	22	5	7	5⅝	23	5½	7	9⅝	24	6⅛
6	9¾	21	4¾	7	1¾	22	5⅜	7	5¾	23	6	7	9¾	24	6½
6	9⅞	21	5⅛	7	1⅞	22	5¾	7	5⅞	23	6⅜	7	9⅞	24	6⅞
6	10	21	5½	7	2	22	6⅛	7	6	23	6¾	7	10	24	7¼
6	10⅛	21	6	7	2⅛	22	6½	7	6⅛	23	7⅛	7	10⅛	24	7⅝
6	10¼	21	6⅜	7	2¼	22	7	7	6¼	23	7½	7	10¼	24	8
6	10⅜	21	6¾	7	2⅜	22	7⅜	7	6⅜	23	7⅞	7	10⅜	24	8½
6	10½	21	7⅛	7	2½	22	7¾	7	6½	23	8¼	7	10½	24	8⅞
6	10⅝	21	7⅝	7	2⅝	22	8⅛	7	6⅝	23	8¾	7	10⅝	24	9¼
6	10¾	21	8	7	2¾	22	8½	7	6¾	23	9⅛	7	10¾	24	9⅝
6	10⅞	21	8⅜	7	2⅞	22	8⅞	7	6⅞	23	9½	7	10⅞	24	10
6	11	21	8¾	7	3	22	9¼	7	7	23	9⅞	7	11	24	10½
6	11⅛	21	9⅛	7	3⅛	22	9¾	7	7⅛	23	10¼	7	11⅛	24	10⅞
6	11¼	21	9½	7	3¼	22	10⅛	7	7¼	23	10⅝	7	11¼	24	11¼
6	11⅜	21	9⅞	7	3⅜	22	10½	7	7⅜	23	11	7	11⅜	24	11⅝
6	11½	21	10⅜	7	3½	22	10⅞	7	7½	23	11½	7	11½	25	0
6	11⅝	21	10¾	7	3⅝	22	11¼	7	7⅝	23	11⅞	7	11⅝	25	0⅜
6	11¾	21	11⅛	7	3¾	22	11⅝	7	7¾	24	0¼	7	11¾	25	0¾
6	11⅞	21	11½	7	3⅞	23	0	7	7⅞	24	0⅝	7	11⅞	25	1¼
7	0	21	11⅞	7	4	23	0½	7	8	24	1	8	0	25	1⅝
7	0⅛	22	0¼	7	4⅛	23	0⅞	7	8⅛	24	1⅜	8	0⅛	25	2
7	0¼	22	0⅝	7	4¼	23	1¼	7	8¼	24	1¾	8	0¼	25	2⅜
7	0⅜	22	1	7	4⅜	23	1⅝	7	8⅜	24	2¼	8	0⅜	25	2¾
7	0½	22	1½	7	4½	23	2	7	8½	24	2⅞	8	0½	25	3⅛
7	0⅝	22	1⅞	7	4⅝	23	2⅜	7	8⅝	24	3	8	0⅝	25	3½
7	0¾	22	2¼	7	4¾	23	2¾	7	8¾	24	3⅜	8	0¾	25	3⅞
7	0⅞	22	2⅝	7	4⅞	23	3¼	7	8⅞	24	3¾	8	0⅞	25	4⅜

DIAMETERS AND CIRCUMFERENCES.

DIAMETER		CIRCUMFERENCE		DIAMETER		CIRCUMFERENCE		DIAMETER		CIRCUMFERENCE.		DIAMETER		CIRCUMFERENCE	
FT.	IN.	FT.	IN.	FT.	IN	FT.	IN.	FT.	IN	FT.	IN.	FT.	IN.	FT.	IN.
8	1	25	4¼	8	5	26	5¼	8	9	27	5⅞	9	1	28	6⅜
8	1⅛	25	5⅛	8	5⅛	26	5⅝	8	9⅛	27	6¼	9	1⅛	28	6⅞
8	1¼	25	5½	8	5¼	26	6	8	9¼	27	6⅝	9	1¼	28	7¼
8	1⅜	25	5⅞	8	5⅜	26	6½	8	9⅜	27	7	9	1⅜	28	7⅝
8	1½	25	6¼	8	5½	26	6⅞	8	9½	27	7⅜	9	1½	28	8
8	1⅝	25	6⅝	8	5⅝	26	7¼	8	9⅝	27	7⅞	9	1⅝	28	8⅜
8	1¾	25	7	8	5¾	26	7⅝	8	9¾	27	8¼	9	1¾	28	8⅞
8	1⅞	25	7½	8	5⅞	26	8	8	9⅞	27	8⅝	9	1⅞	28	9⅛
8	2	25	7⅞	8	6	26	8⅜	8	10	27	9	9	2	28	9⅝
8	2⅛	25	8¼	8	6⅛	26	8⅞	8	10⅛	27	9⅜	9	2⅛	28	10
8	2¼	25	8⅝	8	6¼	26	9¼	8	10¼	27	9¾	9	2¼	28	10⅜
8	2⅜	25	9	8	6⅜	26	9⅝	8	10⅜	27	10⅛	9	2⅜	28	10¾
8	2½	25	9½	8	6½	26	10	8	10½	27	10⅝	9	2½	28	11⅛
8	2⅝	25	9⅞	8	6⅝	26	10⅜	8	10⅝	27	11	9	2⅝	28	11½
8	2¾	25	10¼	8	6¾	26	10¾	8	10¾	27	11⅜	9	2¾	28	11⅞
8	2⅞	25	10⅝	8	6⅞	26	11⅛	8	10⅞	27	11¾	9	2⅞	29	0⅜
8	3	25	11	8	7	26	11½	8	11	28	0⅛	9	3	29	0¾
8	3⅛	25	11⅜	8	7⅛	27	0	8	11⅛	28	0½	9	3⅛	29	1⅛
8	3¼	25	11¾	8	7¼	27	0⅜	8	11¼	28	0⅞	9	3¼	29	1½
8	3⅜	26	0⅛	8	7⅜	27	0¾	8	11⅜	28	1⅜	9	3⅜	29	1⅞
8	3½	26	0⅝	8	7½	27	1⅛	8	11½	28	1¾	9	3½	29	2¼
8	3⅝	26	1	8	7⅝	27	1½	8	11⅝	28	2⅛	9	3⅝	29	2⅝
8	3¾	26	1⅜	8	7¾	27	1⅞	8	11¾	28	2½	9	3¾	29	3
8	3⅞	26	1¾	8	7⅞	27	2⅜	8	11⅞	28	2⅞	9	3⅞	29	3½
8	4	26	2⅛	8	8	27	2¾	9	0	28	3¼	9	4	29	3⅞
8	4⅛	26	2½	8	8⅛	27	3⅛	9	0⅛	28	3⅝	9	4⅛	29	4¼
8	4¼	26	2⅞	8	8¼	27	3½	9	0¼	28	4	9	4¼	29	4⅝
8	4⅜	26	3⅜	8	8⅜	27	3⅞	9	0⅜	28	4½	9	4⅜	29	5
8	4½	26	3¾	8	8½	27	4¼	9	0½	28	4⅞	9	4½	29	5⅜
8	4⅝	26	4⅛	8	8⅝	27	4⅝	9	0⅝	28	5¼	9	4⅝	29	5¾
8	4¾	26	4½	8	8¾	27	5	9	0¾	28	5⅝	9	4¾	29	6¼
8	4⅞	26	4⅞	8	8⅞	27	5½	9	0⅞	28	6	9	4⅞	29	6⅜

DIAMETERS AND CIRCUMFERENCES.

DIAMETER		CIRCUMFERENCE		DIAMETER		CIRCUMFERENCE		DIAMETER		CIRCUMFERENCE.		DIAMETER		CIRCUMFERENCE	
FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN	FT.	IN.	FT.	IN.	FT.	IN
9	5	29	7	9	9	30	7 1/8	10	1	31	8 1/8	10	5	32	8 1/2
9	5 1/8	29	7 3/8	9	9 1/8	30	7 7/8	10	1 1/8	31	8 1/2	10	5 1/8	32	9
9	5 1/4	29	7 3/4	9	9 1/4	30	8 3/8	10	1 1/4	31	8 7/8	10	5 1/4	32	9 1/2
9	5 3/8	29	8 1/8	9	9 3/8	30	8 3/4	10	1 3/8	31	9 1/4	10	5 3/8	32	9 7/8
9	5 1/2	29	8 1/2	9	9 1/2	30	9 1/8	10	1 1/2	31	9 5/8	10	5 1/2	32	10 1/4
9	5 5/8	29	9	9	9 5/8	30	9 1/2	10	1 5/8	31	10	10	5 5/8	32	10 5/8
9	5 3/4	29	9 3/8	9	9 3/4	30	9 7/8	10	1 3/4	31	10 1/2	10	5 3/4	32	11
9	5 7/8	29	9 3/4	9	9 7/8	30	10 1/4	10	1 7/8	31	10 7/8	10	5 7/8	32	11 3/8
9	6	29	10 1/8	9	10	30	10 5/8	10	2	31	11 1/4	10	6	32	11 7/8
9	6 1/8	29	10 1/2	9	10 1/8	30	11 1/8	10	2 1/8	31	11 5/8	10	6 1/8	33	0 1/4
9	6 1/4	29	10 7/8	9	10 1/4	30	11 1/2	10	2 1/4	32	0	10	6 1/4	33	0 5/8
9	6 3/8	29	11 1/4	9	10 3/8	30	11 7/8	10	2 3/8	32	0 1/2	10	6 3/8	33	1
9	6 1/2	29	11 5/8	9	10 1/2	31	0 1/8	10	2 1/2	22	0 7/8	10	6 1/2	33	1 3/8
9	6 5/8	30	0	9	10 5/8	31	0 5/8	10	2 5/8	32	1 1/4	10	6 5/8	33	1 3/4
9	6 3/4	30	0 1/2	9	10 3/4	31	1	10	2 3/4	32	1 5/8	10	6 3/4	33	2 1/8
9	6 7/8	30	0 7/8	9	10 7/8	31	1 3/8	10	2 7/8	32	2	10	6 7/8	33	2 5/8
9	7	30	1 1/4	9	11	31	1 7/8	10	3	32	2 3/8	10	7	33	3
9	7 1/8	30	1 5/8	9	11 1/8	31	2 1/4	10	3 1/8	32	2 3/4	10	7 1/8	33	3 3/8
9	7 1/4	30	2	9	11 1/4	31	2 5/8	10	3 1/4	32	3 1/4	10	7 1/4	33	3 3/4
9	7 3/8	30	2 1/2	9	11 3/8	31	3	10	3 3/8	32	3 5/8	10	7 3/8	33	4 1/8
9	7 1/2	30	2 7/8	9	11 1/2	31	3 3/8	10	3 1/2	32	4	10	7 1/2	33	4 1/2
9	7 5/8	30	3 1/4	9	11 5/8	31	3 3/4	10	3 5/8	32	4 3/8	10	7 5/8	33	4 7/8
9	7 3/4	30	3 5/8	9	11 3/4	31	4 1/4	10	3 3/4	32	4 3/4	10	7 3/4	33	5 3/8
9	7 7/8	30	4	9	11 7/8	31	4 5/8	10	3 7/8	32	5 1/8	10	7 7/8	33	5 3/4
9	8	30	4 3/8	10	0	31	5	10	4	32	5 1/2	10	8	33	6 1/8
9	8 1/8	30	4 3/4	10	0 1/8	31	5 3/8	10	4 1/8	32	6	10	8 1/8	33	6 1/2
9	8 1/4	30	5 1/4	10	0 1/4	31	5 3/4	10	4 1/4	32	6 3/8	10	8 1/4	33	6 7/8
9	8 3/8	30	5 5/8	10	0 3/8	31	6 1/8	10	4 3/8	32	6 3/4	10	8 3/8	33	7 1/4
9	8 1/2	30	6	10	0 1/2	31	6 1/2	10	4 1/2	32	7 1/8	10	8 1/2	33	7 5/8
9	8 5/8	30	6 3/8	10	0 5/8	31	7	10	4 5/8	32	7 1/2	10	8 5/8	33	8
9	8 3/4	30	6 3/4	10	0 3/4	31	7 3/8	10	4 3/4	32	7 7/8	10	8 3/4	33	8 1/2
9	8 7/8	30	7 1/8	10	0 7/8	31	7 3/4	10	4 7/8	32	8 1/4	10	8 7/8	33	8 7/8

DIAMETERS AND CIRCUMFERENCES.

DIAMETER		CIRCUMFERENCE		DIAMETER		CIRCUMFERENCE		DIAMETER		CIRCUMFERENCE.		DIAMETER		CIRCUMFERENCE	
FT.	IN.	FT.	IN.	FT.	IN	FT.	IN.	FT.	IN	FT.	IN.	FT.	IN.	FT.	IN.
10	9	33	9¼	11	1	34	9¾	11	5	35	10⅜	11	9	36	10⅞
10	9⅛	33	9⅜	11	1⅛	34	10¼	11	5⅛	35	10¾	11	9⅛	36	11¼
10	9¼	33	10	11	1¼	34	10⅜	11	5¼	35	11⅛	11	9¼	36	11¾
10	9⅜	33	10⅜	11	1⅜	34	11	11	5⅜	35	11½	11	9⅜	37	0⅛
10	9½	33	10¾	11	1½	34	11⅜	11	5½	36	0	11	9½	37	0½
10	9⅝	33	11¼	11	1⅝	34	11¾	11	5⅝	36	0⅜	11	9⅝	37	0⅞
10	9¾	33	11⅝	11	1¾	35	0⅛	11	5¾	36	0¾	11	9¾	37	1⅜
10	9⅞	34	0	11	1⅞	35	0½	11	5⅞	36	1⅛	11	9⅞	37	1¾
10	10	34	0⅜	11	2	35	1	11	6	36	1½	11	10	37	2⅛
10	10⅛	34	0¾	11	2⅛	35	1⅜	11	6⅛	36	1⅞	11	10⅛	37	2½
10	10¼	34	1⅛	11	2¼	35	1¾	11	6¼	36	2⅜	11	10¼	37	2⅞
10	10⅜	34	1⅝	11	2⅜	35	2⅛	11	6⅜	36	2¾	11	10⅜	37	3¼
10	10½	34	2	11	2½	35	2½	11	6½	36	3⅛	11	10½	37	3⅝
10	10⅝	34	2⅜	11	2⅝	35	2⅞	11	6⅝	36	3½	11	10⅝	37	4
10	10¾	34	2¾	11	2¾	35	3⅜	11	6¾	36	3⅞	11	10¾	37	4½
10	10⅞	34	3⅛	11	2⅞	35	3¾	11	6⅞	36	4¼	11	10⅞	37	4⅞
10	11	34	3½	11	3	35	4⅛	11	7	36	4⅝	11	11	37	5¼
10	11⅛	34	3⅞	11	3⅛	35	4½	11	7⅛	36	5	11	11⅛	37	5⅝
10	11¼	34	4⅜	11	3¼	35	4⅞	11	7¼	36	5½	11	11¼	37	6
10	11⅜	34	4¾	11	3⅜	35	5¼	11	7⅜	36	5⅞	11	11⅜	37	6⅜
10	11½	34	5⅛	11	3½	35	5⅝	11	7½	36	6¼	11	11½	37	6⅞
10	11⅝	34	5½	11	3⅝	35	6	11	7⅝	36	6⅝	11	11⅝	37	7¼
10	11¾	34	5⅞	11	3¾	35	6½	11	7¾	36	7	11	11¾	37	7⅝
10	11⅞	34	6¼	11	3⅞	35	6⅞	11	7⅞	36	7⅜	11	11⅞	37	8
11	0	34	6⅝	11	4	35	7¼	11	8	36	7¾	12	0	37	8⅜
11	0⅛	34	7	11	4⅛	35	7⅝	11	8⅛	36	8⅛	12	0⅛	37	8¾
11	0¼	34	7½	11	4¼	35	8	11	8¼	36	8½	12	0¼	37	9⅛
11	0⅜	34	7⅞	11	4⅜	35	8⅜	11	8⅜	36	8⅞	12	0⅜	37	9½
11	0½	34	8¼	11	4½	35	8⅞	11	8½	36	9¼	12	0½	37	10
11	0⅝	34	8⅝	11	4⅝	35	9¼	11	8⅝	36	9⅝	12	0⅝	37	10⅜
11	0¾	34	9	11	4¾	35	9⅝	11	8¾	36	10⅛	12	0¾	37	10¾
11	0⅞	34	9⅜	11	4⅞	35	10	11	8⅞	36	10½	12	0⅞	37	11⅛

DIAMETERS AND CIRCUMFERENCES.

DIAMETER		CIRCUMFERENCE		DIAMETER		CIRCUMFERENCE		DIAMETER		CIRCUMFERENCE		DIAMETER		CIRCUMFERENCE	
FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN	FT.	IN.	FT.	IN.	FT.	IN.
12	1	37	11½	12	5	39	0⅛	12	9	40	0⅜	13	1	41	1¼
12	1⅛	38	0	12	5⅛	39	0½	12	9⅛	40	1	13	1⅛	41	1⅝
12	1¼	38	0⅜	12	5¼	39	0⅞	12	9¼	40	1⅜	13	1¼	41	2
12	1⅜	38	0¾	12	5⅜	39	1¼	12	9⅜	40	1⅞	13	1⅜	41	2⅜
12	1½	38	1⅛	12	5½	39	1⅝	12	9½	40	2¼	13	1½	41	2¾
12	1⅝	38	1½	12	5⅝	39	2	12	9⅝	40	2⅝	13	1⅝	41	3⅛
12	1¾	38	1⅞	12	5¾	39	2⅜	12	9¾	40	3	13	1¾	41	3⅜
12	1⅞	38	2¼	12	5⅞	39	2⅞	12	9⅞	40	3⅜	13	1⅞	41	4
12	2	38	2⅝	12	6	39	3¼	12	10	40	3¾	13	2	41	4⅜
12	2⅛	38	3	12	6⅛	39	3⅝	12	10⅛	40	4⅛	13	2⅛	41	4¾
12	2¼	38	3½	12	6¼	39	4	12	10¼	40	4⅝	13	2¼	41	5⅛
12	2⅜	38	3⅞	12	6⅜	39	4⅜	12	10⅜	40	5	13	2⅜	41	5½
12	2½	38	4¼	12	6½	39	4¾	12	10½	40	5⅜	13	2½	41	5⅞
12	2⅝	38	4⅝	12	6⅝	39	5¼	12	10⅝	40	5¾	13	2⅝	41	6¼
12	2¾	38	5	12	6¾	39	5⅝	12	10¾	40	6⅛	13	2¾	41	6¾
12	2⅞	38	5⅜	12	6⅞	39	6	12	10⅞	40	6½	13	2⅞	41	7⅛
12	3	38	5¾	12	7	39	6⅜	12	11	40	6⅞	13	3	41	7½
12	3⅛	38	6¼	12	7⅛	39	6¾	12	11⅛	40	7⅜	13	3⅛	41	7⅞
12	3¼	38	6⅝	12	7¼	39	7⅛	12	11¼	40	7¾	13	3¼	41	8¼
12	3⅜	38	7	12	7⅜	39	7½	12	11⅜	40	8⅛	13	3⅜	41	8⅝
12	3½	38	7⅜	12	7½	39	7⅞	12	11½	40	8½	13	3½	41	9
12	3⅝	38	7¾	12	7⅝	39	8⅜	12	11⅝	40	8⅞	13	3⅝	41	9½
12	3¾	38	8⅛	12	7¾	39	8¾	12	11¾	40	9¼	13	3¾	41	9⅞
12	3⅞	38	8½	12	7⅞	39	9⅛	12	11⅞	40	9⅝	13	3⅞	41	10¼
12	4	38	9	12	8	39	9½	13	0	40	10	13	4	41	10⅝
12	4⅛	38	9⅜	12	8⅛	39	9⅞	13	0⅛	40	10⅜	13	4⅛	41	11
12	4¼	38	9¾	12	8¼	39	10¼	13	0¼	40	10⅞	13	4¼	41	11⅜
12	4⅜	38	10⅛	12	8⅜	39	10⅝	13	0⅜	40	11¼	13	4⅜	41	11¾
12	4½	38	10½	12	8½	39	11	13	0½	40	11⅝	13	4½	42	0¼
12	4⅝	38	10⅞	12	8⅝	39	11½	13	0⅝	41	0	13	4⅝	42	0⅝
12	4¾	38	11¼	12	8¾	39	11⅞	13	0¾	41	0⅜	13	4¾	42	1
12	4⅞	38	11¾	12	8⅞	40	0¼	13	0⅞	41	0⅞	13	4⅞	42	1⅜

DIAMETERS AND CIRCUMFERENCES.

DIAMETER		CIRCUMFERENCE		DIAMETER		CIRCUMFERENCE		DIAMETER		CIRCUMFERENCE.		DIAMETER		CIRCUMFERENCE	
FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN	FT.	IN.	FT.	IN.	FT.	IN.
13	5	42	1¾	13	9	43	2⅜	14	1	44	2⅞	14	5	45	3½
13	5⅛	42	2⅛	13	9⅛	43	2¾	14	1⅛	44	3½	14	5⅛	45	3⅞
13	5¼	42	2½	13	9¼	43	3⅛	14	1¼	44	3¾	14	5¼	45	4¼
13	5⅜	42	3	13	9⅜	43	3½	14	1⅜	44	4⅛	14	5⅜	45	4⅝
13	5½	42	3⅜	13	9½	43	3⅞	14	1½	44	4½	14	5½	45	5
13	5⅝	42	3¾	13	9⅝	43	4¼	14	1⅝	44	4⅞	14	5⅝	45	5⅜
13	5¾	42	4⅛	13	9¾	43	4¾	14	1¾	44	5¼	14	5¾	45	5⅞
13	5⅞	42	4½	13	9⅞	43	5⅛	14	1⅞	44	5⅝	14	5⅞	45	6¼
13	6	42	4⅞	13	10	43	5½	14	2	44	6	14	6	45	6⅝
13	6⅛	42	5¼	13	10⅛	43	5⅞	14	2⅛	44	6⅜	14	6⅛	45	7
13	6¼	42	5¾	13	10¼	43	6¼	14	2¼	44	6⅞	14	6¼	45	7⅜
13	6⅜	42	6⅛	13	10⅜	43	6⅝	14	2⅜	44	7¼	14	6⅜	45	7¾
13	6½	42	6½	13	10½	43	7	14	2½	44	7⅝	14	6½	45	8¼
13	6⅝	42	6⅞	13	10⅝	43	7½	14	2⅝	44	8	14	6⅝	45	8⅝
13	6¾	42	7¼	13	10¾	43	7⅞	14	2¾	44	8⅜	14	6¾	45	9
13	6⅞	42	7⅝	13	10⅞	43	8¼	14	2⅞	44	8¾	14	6⅞	45	9⅜
13	7	42	8	13	11	43	8⅝	14	3	44	9⅛	14	7	45	9¾
13	7⅛	42	8½	13	11⅛	43	9	14	3⅛	44	9½	14	7⅛	45	10⅛
13	7¼	42	8⅞	13	11¼	43	9⅜	14	3¼	44	10	14	7¼	45	10½
13	7⅜	42	9¼	13	11⅜	43	9¾	14	3⅜	44	10⅜	14	7⅜	45	10⅞
13	7½	42	9⅝	13	11½	43	10¼	14	3½	44	10¾	14	7½	45	11⅜
13	7⅝	42	10	13	11⅝	43	10⅝	14	3⅝	44	11⅛	14	7⅝	45	11¾
13	7¾	42	10⅜	13	11¾	43	11	14	3¾	44	11½	14	7¾	46	0⅛
13	7⅞	42	10⅞	13	11⅞	43	11⅜	14	3⅞	44	11⅞	14	7⅞	46	0½
13	8	42	11¼	14	0	44	11¾	14	4	45	0⅜	14	8	46	0⅞
13	8⅛	42	11⅝	14	0⅛	44	0⅛	14	4⅛	45	0¾	14	8⅛	46	1¼
13	8¼	43	0	14	0¼	44	0½	14	4¼	45	1⅛	14	8¼	46	1⅝
13	8⅜	43	0⅜	14	0⅜	44	0⅞	14	4⅜	45	1½	14	8⅜	46	2
13	8½	43	0¾	14	0½	44	1⅜	14	4½	45	1⅞	14	8½	46	2½
13	8⅝	43	1⅛	14	0⅝	44	1¾	14	4⅝	45	2¼	14	8⅝	46	2⅞
13	8¾	43	1½	14	0¾	44	2⅛	14	4¾	45	2¾	14	8¾	46	3¼
13	8⅞	43	1⅞	14	0⅞	44	2½	14	4⅞	45	3⅛	14	8⅞	46	3⅝

DIAMETERS AND CIRCUMFERENCES.

DIAMETER		CIRCUMFERENCE		DIAMETER		CIRCUMFERENCE		DIAMETER		CIRCUMFERENCE.		DIAMETER		CIRCUMFERENCE	
FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN	FT.	IN.	FT.	IN.	FT.	IN.
14	9	46	4	15	1	47	4 5/8	15	5	48	5 1/8	15	9	49	5 3/4
14	9 1/8	46	4 3/8	15	1 1/8	47	5	15	5 1/8	48	5 5/8	15	9 1/8	49	6 1/8
14	9 1/4	46	4 7/8	15	1 1/4	47	5 3/8	15	5 1/4	48	6	15	9 1/4	49	6 1/2
14	9 3/8	46	5 1/4	15	1 3/8	47	5 3/4	15	5 3/8	48	6 3/8	15	9 3/8	49	6 7/8
14	9 1/2	46	5 5/8	15	1 1/2	47	6 1/4	15	5 1/2	48	6 3/4	15	9 1/2	49	7 3/8
14	9 5/8	46	6	15	1 5/8	47	6 5/8	15	5 5/8	48	7 1/8	15	9 5/8	49	7 3/4
14	9 3/4	46	6 3/8	15	1 3/4	47	7	15	5 3/4	48	7 1/2	15	9 3/4	49	8 1/4
14	9 7/8	46	6 3/4	15	1 7/8	47	7 3/8	15	5 7/8	48	7 7/8	15	9 7/8	49	8 1/2
14	10	46	7 1/8	15	2	47	7 3/4	15	6	48	8 3/8	15	10	49	8 7/8
14	10 1/8	46	7 1/2	15	2 1/8	47	8 1/8	15	6 1/8	48	8 3/4	15	10 1/8	49	9 1/4
14	10 1/4	46	7 7/8	15	2 1/4	47	8 1/2	15	6 1/4	48	9 1/8	15	10 1/4	49	9 5/8
14	10 3/8	46	8 3/8	15	2 3/8	47	9	15	6 3/8	48	9 1/2	15	10 3/8	49	10
14	10 1/2	46	8 3/4	15	2 1/2	47	9 3/8	15	6 1/2	48	9 7/8	15	10 1/2	49	10 1/2
14	10 5/8	46	9 1/8	15	2 5/8	47	9 3/4	15	6 5/8	48	10 1/4	15	10 5/8	49	10 7/8
14	10 3/4	46	9 1/2	15	2 3/4	47	10 1/8	15	6 3/4	48	10 5/8	15	10 3/4	49	11 1/4
14	10 7/8	46	9 7/8	15	2 7/8	47	10 1/2	15	6 7/8	48	11	15	10 7/8	49	11 5/8
14	11	46	10 3/8	15	3	47	10 7/8	15	7	48	11 1/2	15	11	50	0
14	11 1/8	46	10 3/4	15	3 1/8	47	11 1/4	15	7 1/8	48	11 7/8	15	11 1/8	50	0 1/2
14	11 1/4	46	11 1/8	15	3 1/4	47	11 3/4	15	7 1/4	49	0 1/4	15	11 1/4	50	0 7/8
14	11 3/8	46	11 1/2	15	3 3/8	48	0 1/8	15	7 3/8	49	0 5/8	15	11 3/8	50	1 1/4
14	11 1/2	46	11 7/8	15	3 1/2	48	0 1/2	15	7 1/2	49	1	15	11 1/2	50	1 5/8
14	11 5/8	47	0 1/4	15	3 5/8	48	0 7/8	15	7 5/8	49	1 3/8	15	11 5/8	50	2
14	11 3/4	47	0 3/4	15	3 3/4	48	1 1/4	15	7 3/4	49	1 3/4	15	11 3/4	50	2 3/8
14	11 7/8	47	1 1/8	15	3 7/8	48	1 5/8	15	7 7/8	49	2 1/4	15	11 7/8	50	2 3/4
15	0	47	1 1/2	15	4	48	2	15	8	49	2 5/8	16	0	50	3 1/8
15	0 1/8	47	1 7/8	15	4 1/8	48	2 3/8	15	8 1/8	49	3	16	0 1/8	50	3 1/2
15	0 1/4	47	2 1/4	15	4 1/4	48	2 7/8	15	8 1/4	49	3 3/8	16	0 1/4	50	4
15	0 3/8	47	2 5/8	15	4 3/8	48	3 1/4	15	8 3/8	49	3 3/4	16	0 3/8	50	4 3/8
15	0 1/2	47	3	15	4 1/2	48	3 5/8	15	8 1/2	49	4 1/8	16	0 1/2	50	4 3/4
15	0 5/8	47	3 3/8	15	4 5/8	48	4	15	8 5/8	49	4 1/2	16	0 5/8	50	5 1/8
15	0 3/4	47	3 7/8	15	4 3/4	48	4 3/8	15	8 3/4	49	5	16	0 3/4	50	5 1/2
15	0 7/8	47	4 1/4	15	4 7/8	48	4 3/4	15	8 7/8	49	5 3/8	16	0 7/8	50	5 7/8

THE BOILER-MAKERS'

AND

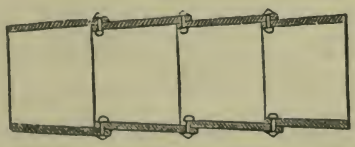
IRON SHIP-BUILDERS' COMPANION.

SECTION V.

TEMPLATE MAKING.

REMARKS.—Boilers, when made of a cylindrical form, usually consist of a series of conic frustums inserted into each other, and riveted together; the height of each frustum being the breadth of plate of iron, and the inside diameter at large end equal to the given diameter of the boiler, that of the small end twice the thickness of plate less than the large end. This will be clearly understood on inspection of figure 1.

FIG. 1.

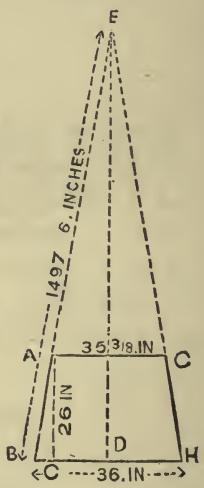


In preparing to make such a boiler, the PLATER generally procures a template or pattern plate, the length of which is some known proportion of the circumference of the boiler, and breadth suitable to the plates of iron of which the boiler is to be made;

this template is usually a thin sheet of iron or frame of wood, made to the proper length and shape and pierced with holes for the rivets, so that it forms a complete pattern by which the whole of the plates can be at once drawn and punched. The method of making the template will be easily understood by the following—

EXAMPLE.—Let it be required to build a tubular boiler of 36 in., inside diameter, to be formed of 2 plates in the circle, the breadth of the plates 26 inches, and the thickness of plates $\frac{5}{16}$ of an inch, the distance between centres of rivet holes about 2 inches.

FIG. 2.



By the above example, it is clear the frustum of one of the cones composing the boiler will be according to figure 2, as A B G H.

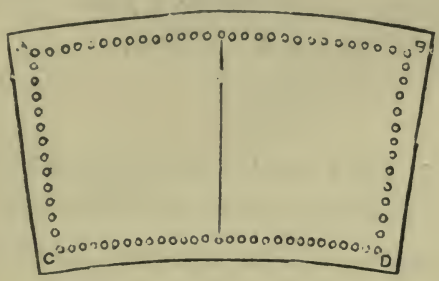
The first step will be to find the point or vertex of the cone E, of which the frustum is a part; this will be found by the following proportion, which is derived from the sixth book of Euclid, viz. :—BC : BD :: BA : BE, or in words the thickness of the boiler plate is to the radius of the boiler, as the breadth of the plate is to the slant edge of the cone, which will be the radius with which the curve of the outside of the template must be drawn. The calculation is given at length.

As $\frac{5}{16}$ in. : 18 in. :: 26 in. : slant edge of cone=1497·6.

$$\begin{array}{r} 18 \\ \hline 468 \\ 16 \\ \hline 5\,)\;7488 \\ \hline 1497{\cdot}6 \text{ inches.} \end{array}$$

To 36 inches, the inside diameter of boiler, add $\frac{5}{16}$ of an inch, the thickness of plate, equal to $36\frac{5}{16}$ inches, the circumference of which is 114·0793 inches, and as it is proposed to have 2 plates in the circle, the length of each plate will be 57·0396 inches, on the outer curve line. And as the diameter of small end of the frustum is twice the thickness of the plate less than the larger, or $35\frac{3}{8}$ inches, to which add thickness of plate, equal to $35\frac{11}{16}$ inches, the circumference of which is 112·1158 inches; the length of plate on the inner curve line will be $\frac{112.1158}{2}$=56·0579 inches, the template therefore, will be as figure 3.

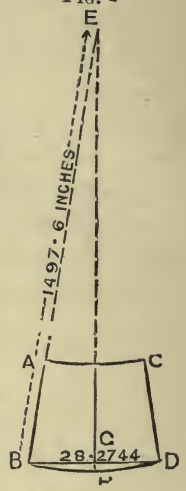
FIG. 3.



A B=57·0396 inches, C D=56·0579 inches, A C=26 inches.

It will be perceived that as the radius with which the outside of template is to be drawn, is 1497·6 inches, it would be inconvenient to draw a circle with a radius of that length by the common mode; therefore some other method has to be adopted for finding the curve; the one usually taken is to calculate the versed line corresponding to the curve of the template, and then trace the curve by means of a thin lath bent round the three points, viz.:—the two extremities of the straight line and the versed line.

FIG. 4



The mode of calculating the versed line will be easily understood by the following process, which is given at length; but let it be observed in calculating the versed line, it is only necessary to take the circumference of the given diameter, hence the circumference of 36 inches is equal to 113·0976 inches, this divided by 2 gives 56·5488 inches, for one of the plates.

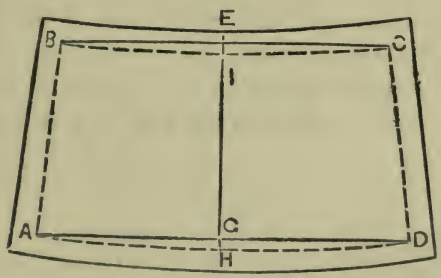
In the right angled triangle E B G, is given E B = 1497·6 in., B G $= \frac{56.5488}{2} =$ 28·2744 inches. Then E B^2—B G^2 is = E G^2; hence E G^2 can be found, and consequently the versed line.

28·2744 inches.	1497·6 inches.
28·2744	1497·6
1130976	89856
1130976	104832
1979208	134784
565488	59904
2261952	14976
565488	
799·44169536 = B G^2	2242805·76 = E B^2

```
                2242805·76=E B²
                    799·44—B G²
                ------------
                2242006·32 | 1497·33=E G.
                1
              ----
        24 ) 124
              96
              ----
       289 ) 2820
             2601
             -----
      2987 ) 21906
             20909
             -------
     29943 ) 99732
             89829
             -------
    299463 ) 990300
             898389
             -------
              91911 rem.
```

And 1497·60
1497·33
·27=G H, the versed line, equal to $\frac{17}{64}$.

Fig. 5.



If we now take the thin plate of which the template is to be made, and draw upon it a straight line, as AD=to 57 inches, which bisect by the line E H, and set off G H=$\frac{17}{64}$ths of an inch, the versed line; then by bending a thin rod or lath round the three

points, A H D, the curve of the out side of template may be drawn ; the inside line may be drawn in a similar manner by marking off E B, E C, each equal 28 inches, half the length of the inside, and and A B, D C, and H I, equal to 26 inches, the breadth of the plate.

Table 27, page 149, will be found of the utmost utility to the template maker, and will save him an immense amount of time and trouble in making calculations for frustums of cones for cylindrical boilers.

Example.—Required the calculations for the template for a boiler, whose inside diameter is to be 4 feet, to be made of 3 plates in the circle ; the breadth of the plate 2 feet 4 inches, and thickness of plate $\frac{3}{8}$ of an inch ; the distance between centres of rivet holes to be about 2 inches.

In page 158 will be found the required calculations for the above example. And here I would impress on the workman who wishes to be correct in his operations, to pay strict attention to the lengths given in the table, assuring him that if the template be properly made, there is no doubt but when the plates are bent and applied to each other the holes for the rivets will be exactly opposite, and the inside diameter of the flue, tube, or boiler will be as required.

TABLE XXVII.

TEMPLATE MAKING.

Inside diameter of Tube, Flue, or Boiler.		Thickness of Plate.	Number of Plates in the Circle.	Breadth of Plate between centres of rivet holes.		Length of straight line between centres of rivet holes of Large end of Plate.		Length of straight line between centres of rivet holes of Small end of Plate.		Versed line.
FT.	IN.	Parts of an Inch.	No.	FT.	IN.	FT.	IN.	FT.	IN.	Parts of an Inch.
2	0	$\frac{5}{16}$	2	2	0	3	$2\frac{1}{8}$	3	$1\frac{1}{8}$	$\frac{3}{16}$
2	0	$\frac{5}{16}$	2	2	2	3	$2\frac{1}{8}$	3	$1\frac{1}{8}$	$\frac{3}{16}$
2	0	$\frac{5}{16}$	2	2	4	3	$2\frac{1}{8}$	3	$1\frac{1}{8}$	$\frac{5}{32}$
2	0	$\frac{5}{16}$	2	2	6	3	$2\frac{1}{8}$	3	$1\frac{1}{8}$	$\frac{5}{32}$
2	0	$\frac{5}{16}$	2	2	8	3	$2\frac{1}{8}$	3	$1\frac{1}{8}$	$\frac{5}{32}$
2	0	$\frac{5}{16}$	2	2	10	3	$2\frac{1}{8}$	3	$1\frac{1}{8}$	$\frac{9}{64}$
2	0	$\frac{5}{16}$	2	3	0	3	$2\frac{1}{8}$	3	$1\frac{1}{8}$	$\frac{1}{8}$
2	0	$\frac{5}{16}$	2	3	2	3	$2\frac{1}{8}$	3	$1\frac{1}{8}$	$\frac{1}{8}$
2	0	$\frac{5}{16}$	2	3	4	3	$2\frac{1}{8}$	3	$1\frac{1}{8}$	$\frac{1}{8}$
2	0	$\frac{5}{16}$	2	3	6	3	$2\frac{1}{8}$	3	$1\frac{1}{8}$	$\frac{1}{8}$
2	2	$\frac{5}{16}$	2	2	0	3	$5\frac{1}{4}$	3	$4\frac{1}{4}$	$\frac{13}{64}$
2	2	$\frac{5}{16}$	2	2	2	3	$5\frac{1}{4}$	3	$4\frac{1}{4}$	$\frac{3}{16}$
2	2	$\frac{5}{16}$	2	2	4	3	$5\frac{1}{4}$	3	$4\frac{1}{4}$	$\frac{11}{64}$
2	2	$\frac{5}{16}$	2	2	6	3	$5\frac{1}{4}$	3	$4\frac{1}{4}$	$\frac{5}{32}$
2	2	$\frac{5}{16}$	2	2	8	3	$5\frac{1}{4}$	3	$4\frac{1}{4}$	$\frac{5}{32}$
2	2	$\frac{5}{16}$	2	2	10	3	$5\frac{1}{4}$	3	$4\frac{1}{4}$	$\frac{5}{32}$
2	2	$\frac{5}{16}$	2	3	0	3	$5\frac{1}{4}$	3	$4\frac{1}{4}$	$\frac{9}{64}$
2	2	$\frac{5}{16}$	2	3	2	3	$5\frac{1}{4}$	3	$4\frac{1}{4}$	$\frac{1}{8}$
2	2	$\frac{5}{16}$	2	3	4	3	$5\frac{1}{4}$	3	$4\frac{1}{4}$	$\frac{1}{8}$
2	2	$\frac{5}{16}$	2	3	6	3	$5\frac{1}{4}$	3	$4\frac{1}{4}$	$\frac{1}{8}$
2	4	$\frac{5}{16}$	2	2	0	3	$8\frac{3}{8}$	3	$7\frac{3}{8}$	$\frac{7}{32}$
2	4	$\frac{5}{16}$	2	2	2	3	$8\frac{3}{8}$	3	$7\frac{3}{8}$	$\frac{13}{64}$
2	4	$\frac{5}{16}$	2	2	4	3	$8\frac{3}{8}$	3	$7\frac{3}{8}$	$\frac{3}{16}$
2	4	$\frac{5}{16}$	2	2	6	3	$8\frac{3}{8}$	3	$7\frac{3}{8}$	$\frac{11}{64}$
2	4	$\frac{5}{16}$	2	2	8	3	$8\frac{3}{8}$	3	$7\frac{3}{8}$	$\frac{5}{32}$
2	4	$\frac{5}{16}$	2	2	10	3	$8\frac{3}{8}$	3	$7\frac{3}{8}$	$\frac{5}{32}$
2	4	$\frac{5}{16}$	2	3	0	3	$8\frac{3}{8}$	3	$7\frac{3}{8}$	$\frac{5}{32}$
2	4	$\frac{5}{16}$	2	3	2	3	$8\frac{3}{8}$	3	$7\frac{3}{8}$	$\frac{9}{64}$
2	4	$\frac{5}{16}$	2	3	4	3	$8\frac{3}{8}$	3	$7\frac{3}{8}$	$\frac{1}{8}$
2	4	$\frac{5}{16}$	2	3	6	3	$8\frac{3}{8}$	3	$7\frac{3}{8}$	$\frac{1}{8}$

Inside diameter of Tube, Flue, or Boiler.		Thickness of Plate.	Number of Plates in the Circle.	Breadth of Plate between centres of rivet holes.		Length of straight line between centres of rivet holes of Large end of Plate.		Length of straight line between centres of rivet holes of Small end of Plate.		Versed line.
FT.	IN.	Parts of an Inch.	No.	FT.	IN.	FT.	IN.	FT.	IN.	Parts of an Inch.
2	6	$\frac{5}{16}$	2	2	0	3	$11\frac{1}{2}$	3	$10\frac{1}{2}$	$\frac{15}{64}$
2	6	$\frac{5}{16}$	2	2	2	3	$11\frac{1}{2}$	3	$10\frac{1}{2}$	$\frac{7}{32}$
2	6	$\frac{5}{16}$	2	2	4	3	$11\frac{1}{2}$	3	$10\frac{1}{2}$	$\frac{7}{32}$
2	6	$\frac{5}{16}$	2	2	6	3	$11\frac{1}{2}$	3	$10\frac{1}{2}$	$\frac{3}{16}$
2	6	$\frac{5}{16}$	2	2	8	3	$11\frac{1}{2}$	3	$10\frac{1}{2}$	$\frac{3}{16}$
2	6	$\frac{5}{16}$	2	2	10	3	$11\frac{1}{2}$	3	$10\frac{1}{2}$	$\frac{11}{64}$
2	6	$\frac{5}{16}$	2	3	0	3	$11\frac{1}{2}$	3	$10\frac{1}{2}$	$\frac{5}{32}$
2	6	$\frac{5}{16}$	2	3	2	3	$11\frac{1}{2}$	3	$10\frac{1}{2}$	$\frac{5}{32}$
2	6	$\frac{5}{16}$	2	3	4	3	$11\frac{1}{2}$	3	$10\frac{1}{2}$	$\frac{9}{64}$
2	6	$\frac{5}{16}$	2	3	6	3	$11\frac{1}{2}$	3	$10\frac{1}{2}$	$\frac{9}{64}$
2	8	$\frac{5}{16}$	2	2	0	4	$2\frac{5}{8}$	4	$1\frac{5}{8}$	$\frac{1}{4}$
2	8	$\frac{5}{16}$	2	2	2	4	$2\frac{5}{8}$	4	$1\frac{5}{8}$	$\frac{15}{64}$
2	8	$\frac{5}{16}$	2	2	4	4	$2\frac{5}{8}$	4	$1\frac{5}{8}$	$\frac{7}{32}$
2	8	$\frac{5}{16}$	2	2	6	4	$2\frac{5}{8}$	4	$1\frac{5}{8}$	$\frac{13}{64}$
2	8	$\frac{5}{16}$	2	2	8	4	$2\frac{5}{8}$	4	$1\frac{5}{8}$	$\frac{3}{16}$
2	8	$\frac{5}{16}$	2	2	10	4	$2\frac{5}{8}$	4	$1\frac{5}{8}$	$\frac{3}{16}$
2	8	$\frac{5}{16}$	2	3	0	4	$2\frac{5}{8}$	4	$1\frac{5}{8}$	$\frac{11}{64}$
2	8	$\frac{5}{16}$	2	3	2	4	$2\frac{5}{8}$	4	$1\frac{5}{8}$	$\frac{5}{32}$
2	8	$\frac{5}{16}$	2	3	4	4	$2\frac{5}{8}$	4	$1\frac{5}{8}$	$\frac{5}{32}$
2	8	$\frac{5}{16}$	2	3	6	4	$2\frac{5}{8}$	4	$1\frac{5}{8}$	$\frac{5}{32}$
2	10	$\frac{5}{16}$	2	2	0	4	$5\frac{3}{4}$	4	$4\frac{3}{4}$	$\frac{17}{64}$
2	10	$\frac{5}{16}$	2	2	2	4	$5\frac{3}{4}$	4	$4\frac{3}{4}$	$\frac{1}{4}$
2	10	$\frac{5}{16}$	2	2	4	4	$5\frac{3}{4}$	4	$4\frac{3}{4}$	$\frac{15}{64}$
2	10	$\frac{5}{16}$	2	2	6	4	$5\frac{3}{4}$	4	$4\frac{3}{4}$	$\frac{7}{32}$
2	10	$\frac{5}{16}$	2	2	8	4	$5\frac{3}{4}$	4	$4\frac{3}{4}$	$\frac{13}{64}$
2	10	$\frac{5}{16}$	2	2	10	4	$5\frac{3}{4}$	4	$4\frac{3}{4}$	$\frac{3}{16}$
2	10	$\frac{5}{16}$	2	3	0	4	$5\frac{3}{4}$	4	$4\frac{3}{4}$	$\frac{3}{16}$
2	10	$\frac{5}{16}$	2	3	2	4	$5\frac{3}{4}$	4	$4\frac{3}{4}$	$\frac{11}{64}$
2	10	$\frac{5}{16}$	2	3	4	4	$5\frac{3}{4}$	4	$4\frac{3}{4}$	$\frac{5}{32}$
2	10	$\frac{5}{16}$	2	3	6	4	$5\frac{3}{4}$	4	$4\frac{3}{4}$	$\frac{5}{32}$

TEMPLATE MAKING.

Inside diameter of Tube, Flue, or Boiler.		Thickness of Plate.	Number of Plates in the Circle.	Breadth of Plate between centres of rivet holes.		Length of straight line between centres of rivet holes of Large end of Plate.		Length of straight line between centres of rivet holes of Small end of Plate.		Vereed line.
FT.	IN.	Parts of an Inch.	No.	FT.	IN.	FT.	IN.	FT.	IN.	Parts of an Inch.
3	0	$\frac{5}{16}$	2	2	0	4	9	4	8	$\frac{9}{32}$
3	0	$\frac{5}{16}$	2	2	2	4	9	4	8	$\frac{1}{4}$
3	0	$\frac{5}{16}$	2	2	4	4	9	4	8	$\frac{1}{4}$
3	0	$\frac{5}{16}$	2	2	6	4	9	4	8	$\frac{7}{32}$
3	0	$\frac{5}{16}$	2	2	8	4	9	4	8	$\frac{7}{32}$
3	0	$\frac{5}{16}$	2	2	10	4	9	4	8	$\frac{13}{64}$
3	0	$\frac{5}{16}$	2	3	0	4	9	4	8	$\frac{3}{16}$
3	0	$\frac{5}{16}$	2	3	2	4	9	4	8	$\frac{3}{16}$
3	0	$\frac{5}{16}$	2	3	4	4	9	4	8	$\frac{11}{64}$
3	0	$\frac{5}{16}$	2	3	6	4	9	4	8	$\frac{11}{64}$
3	2	$\frac{5}{16}$	2	2	0	5	$0\frac{1}{8}$	4	$11\frac{1}{8}$	$\frac{19}{64}$
3	2	$\frac{5}{16}$	2	2	2	5	$0\frac{1}{8}$	4	$11\frac{1}{8}$	$\frac{9}{32}$
3	2	$\frac{5}{16}$	2	2	4	5	$0\frac{1}{8}$	4	$11\frac{1}{8}$	$\frac{17}{64}$
3	2	$\frac{5}{16}$	2	2	6	5	$0\frac{1}{8}$	4	$11\frac{1}{8}$	$\frac{1}{4}$
3	2	$\frac{5}{16}$	2	2	8	5	$0\frac{1}{8}$	4	$11\frac{1}{8}$	$\frac{7}{32}$
3	2	$\frac{5}{16}$	2	2	10	5	$0\frac{1}{8}$	4	$11\frac{1}{8}$	$\frac{7}{32}$
3	2	$\frac{5}{16}$	2	3	0	5	$0\frac{1}{8}$	4	$11\frac{1}{8}$	$\frac{13}{64}$
3	2	$\frac{5}{16}$	2	3	2	5	$0\frac{1}{8}$	4	$11\frac{1}{8}$	$\frac{3}{16}$
3	2	$\frac{5}{16}$	2	3	4	5	$0\frac{1}{8}$	4	$11\frac{1}{8}$	$\frac{3}{16}$
3	2	$\frac{5}{16}$	2	3	6	5	$0\frac{1}{8}$	4	$11\frac{1}{8}$	$\frac{11}{64}$
3	4	$\frac{5}{16}$	2	2	0	5	$3\frac{1}{4}$	5	$2\frac{1}{4}$	$\frac{21}{64}$
3	4	$\frac{5}{16}$	2	2	2	5	$3\frac{1}{4}$	5	$2\frac{1}{4}$	$\frac{19}{64}$
3	4	$\frac{5}{16}$	2	2	4	5	$3\frac{1}{4}$	5	$2\frac{1}{4}$	$\frac{9}{32}$
3	4	$\frac{5}{16}$	2	2	6	5	$3\frac{1}{4}$	5	$2\frac{1}{4}$	$\frac{1}{4}$
3	4	$\frac{5}{16}$	2	2	8	5	$3\frac{1}{4}$	5	$2\frac{1}{4}$	$\frac{15}{64}$
3	4	$\frac{5}{16}$	2	2	10	5	$3\frac{1}{4}$	5	$2\frac{1}{4}$	$\frac{7}{32}$
3	4	$\frac{5}{16}$	2	3	0	5	$3\frac{1}{4}$	5	$2\frac{1}{4}$	$\frac{13}{64}$
3	4	$\frac{5}{16}$	2	3	2	5	$3\frac{1}{4}$	5	$2\frac{1}{4}$	$\frac{13}{64}$
3	4	$\frac{5}{16}$	2	3	4	5	$3\frac{1}{4}$	5	$2\frac{1}{4}$	$\frac{3}{16}$
3	4	$\frac{5}{16}$	2	3	6	5	$3\frac{1}{4}$	5	$2\frac{1}{4}$	$\frac{3}{16}$

Inside diameter of Tube, Flue, or Boiler.		Thickness of Plate.	Number of Plates in the Circle.	Breadth of Plate between centres of rivet holes.		Length of straight line between centres of rivet holes of Large end of Plate.		Length of straight line between centres of rivet holes of Small end of Plate.		Vessel line.
FT.	IN.	Parts of an Inch.	No.	FT.	IN.	FT.	IN.	FT.	IN.	Parts of an Inch.
3	6	$\frac{5}{16}$	2	2	0	5	$6\frac{3}{8}$	5	$5\frac{3}{8}$	$\frac{21}{64}$
3	6	$\frac{5}{16}$	2	2	2	5	$6\frac{3}{8}$	5	$5\frac{3}{8}$	$\frac{5}{16}$
3	6	$\frac{5}{16}$	2	2	4	5	$6\frac{3}{8}$	5	$5\frac{3}{8}$	$\frac{9}{32}$
3	6	$\frac{5}{16}$	2	2	6	5	$6\frac{3}{8}$	5	$5\frac{3}{8}$	$\frac{17}{64}$
3	6	$\frac{5}{16}$	2	2	8	5	$6\frac{3}{8}$	5	$5\frac{3}{8}$	$\frac{1}{4}$
3	6	$\frac{5}{16}$	2	2	10	5	$6\frac{3}{8}$	5	$5\frac{3}{8}$	$\frac{15}{64}$
3	6	$\frac{5}{16}$	2	3	0	5	$6\frac{3}{8}$	5	$5\frac{3}{8}$	$\frac{7}{32}$
3	6	$\frac{5}{16}$	2	3	2	5	$6\frac{3}{8}$	5	$5\frac{3}{8}$	$\frac{13}{64}$
3	6	$\frac{5}{16}$	2	3	4	5	$6\frac{3}{8}$	5	$5\frac{3}{8}$	$\frac{13}{64}$
3	6	$\frac{5}{16}$	2	3	6	5	$6\frac{3}{8}$	5	$5\frac{3}{8}$	$\frac{3}{16}$
2	0	$\frac{3}{8}$	2	2	0	3	$2\frac{1}{4}$	3	$1\frac{1}{8}$	$\frac{15}{64}$
2	0	$\frac{3}{8}$	2	2	2	3	$2\frac{1}{4}$	3	$1\frac{1}{8}$	$\frac{7}{32}$
2	0	$\frac{3}{8}$	2	2	4	3	$2\frac{1}{4}$	3	$1\frac{1}{8}$	$\frac{13}{64}$
2	0	$\frac{3}{8}$	2	2	6	3	$2\frac{1}{4}$	3	$1\frac{1}{8}$	$\frac{3}{16}$
2	0	$\frac{3}{8}$	2	2	8	3	$2\frac{1}{4}$	3	$1\frac{1}{8}$	$\frac{11}{64}$
2	0	$\frac{3}{8}$	2	2	10	3	$2\frac{1}{4}$	3	$1\frac{1}{8}$	$\frac{5}{32}$
2	0	$\frac{3}{8}$	2	3	0	3	$2\frac{1}{4}$	3	$1\frac{1}{8}$	$\frac{5}{32}$
2	0	$\frac{3}{8}$	2	3	2	3	$2\frac{1}{4}$	3	$1\frac{1}{8}$	$\frac{9}{64}$
2	0	$\frac{3}{8}$	2	3	4	3	$2\frac{1}{4}$	3	$1\frac{1}{8}$	$\frac{9}{64}$
2	0	$\frac{3}{8}$	2	3	6	3	$2\frac{1}{4}$	3	$1\frac{1}{8}$	$\frac{1}{8}$
2	2	$\frac{3}{8}$	2	2	0	3	$5\frac{3}{8}$	3	$4\frac{1}{4}$	$\frac{1}{4}$
2	2	$\frac{3}{8}$	2	2	2	3	$5\frac{3}{8}$	3	$4\frac{1}{4}$	$\frac{15}{64}$
2	2	$\frac{3}{8}$	2	2	4	3	$5\frac{3}{8}$	3	$4\frac{1}{4}$	$\frac{7}{32}$
2	2	$\frac{3}{8}$	2	2	6	3	$5\frac{3}{8}$	3	$4\frac{1}{4}$	$\frac{13}{64}$
2	2	$\frac{3}{8}$	2	2	8	3	$5\frac{3}{8}$	3	$4\frac{1}{4}$	$\frac{3}{16}$
2	2	$\frac{3}{8}$	2	2	10	3	$5\frac{3}{8}$	3	$4\frac{1}{4}$	$\frac{11}{64}$
2	2	$\frac{3}{8}$	2	3	0	3	$5\frac{3}{8}$	3	$4\frac{1}{4}$	$\frac{11}{64}$
2	2	$\frac{3}{8}$	2	3	2	3	$5\frac{3}{8}$	3	$4\frac{1}{4}$	$\frac{5}{32}$
2	2	$\frac{3}{8}$	2	3	4	3	$5\frac{3}{8}$	3	$4\frac{1}{4}$	$\frac{9}{64}$
2	2	$\frac{3}{8}$	2	3	6	3	$5\frac{3}{8}$	3	$4\frac{1}{4}$	$\frac{9}{64}$

Inside diameter of Tube, Flue, or Boiler.		Thickness of Plate.	Number of Plates in the Circle.	Breadth of Plate between centres of rivet holes.		Length of straight line between centres of rivet holes of Large end of Plate.		Length of straight line between centres of rivet holes of Small end of Plate.		Versed line.
FT.	IN.	Parts of an Inch.	No.	FT.	IN.	FT.	IN.	FT.	IN.	Parts of an Inch.
2	4	$\frac{3}{8}$	2	2	0	3	$8\frac{1}{2}$	3	$7\frac{3}{8}$	$\frac{17}{64}$
2	4	$\frac{3}{8}$	2	2	2	3	$8\frac{1}{2}$	3	$7\frac{3}{8}$	$\frac{1}{4}$
2	4	$\frac{3}{8}$	2	2	4	3	$8\frac{1}{2}$	3	$7\frac{3}{8}$	$\frac{15}{64}$
2	4	$\frac{3}{8}$	2	2	6	3	$8\frac{1}{2}$	3	$7\frac{3}{8}$	$\frac{7}{32}$
2	4	$\frac{3}{8}$	2	2	8	3	$8\frac{1}{2}$	3	$7\frac{3}{8}$	$\frac{13}{64}$
2	4	$\frac{3}{8}$	2	2	10	3	$8\frac{1}{2}$	3	$7\frac{3}{8}$	$\frac{3}{16}$
2	4	$\frac{3}{8}$	2	3	0	3	$8\frac{1}{2}$	3	$7\frac{3}{8}$	$\frac{3}{16}$
2	4	$\frac{3}{8}$	2	3	2	3	$8\frac{1}{2}$	3	$7\frac{3}{8}$	$\frac{11}{64}$
2	4	$\frac{3}{8}$	2	3	4	3	$8\frac{1}{2}$	3	$7\frac{3}{8}$	$\frac{5}{32}$
2	4	$\frac{3}{8}$	2	3	6	3	$8\frac{1}{2}$	3	$7\frac{3}{8}$	$\frac{5}{32}$
2	6	$\frac{3}{8}$	2	2	0	3	$11\frac{5}{8}$	3	$10\frac{1}{2}$	$\frac{9}{32}$
2	6	$\frac{3}{8}$	2	2	2	3	$11\frac{5}{8}$	3	$10\frac{1}{2}$	$\frac{17}{64}$
2	6	$\frac{3}{8}$	2	2	4	3	$11\frac{5}{8}$	3	$10\frac{1}{2}$	$\frac{8}{32}$
2	6	$\frac{3}{8}$	2	2	6	3	$11\frac{5}{8}$	3	$10\frac{1}{2}$	$\frac{15}{64}$
2	6	$\frac{3}{8}$	2	2	8	3	$11\frac{5}{8}$	3	$10\frac{1}{2}$	$\frac{7}{32}$
2	6	$\frac{3}{8}$	2	2	10	3	$11\frac{5}{8}$	3	$10\frac{1}{2}$	$\frac{13}{64}$
2	6	$\frac{3}{8}$	2	3	0	3	$11\frac{5}{8}$	3	$10\frac{1}{2}$	$\frac{3}{16}$
2	6	$\frac{3}{8}$	2	3	2	3	$11\frac{5}{8}$	3	$10\frac{1}{2}$	$\frac{3}{16}$
2	6	$\frac{3}{8}$	2	3	4	3	$11\frac{5}{8}$	3	$10\frac{1}{2}$	$\frac{5}{32}$
2	6	$\frac{3}{8}$	2	3	6	3	$11\frac{5}{8}$	3	$10\frac{1}{2}$	$\frac{5}{32}$
2	8	$\frac{3}{8}$	2	2	0	4	$2\frac{3}{4}$	4	$1\frac{5}{8}$	$\frac{9}{32}$
2	8	$\frac{3}{8}$	2	2	2	4	$2\frac{3}{4}$	4	$1\frac{5}{8}$	$\frac{17}{64}$
2	8	$\frac{3}{8}$	2	2	4	4	$2\frac{3}{4}$	4	$1\frac{5}{8}$	$\frac{1}{4}$
2	8	$\frac{3}{8}$	2	2	6	4	$2\frac{3}{4}$	4	$1\frac{5}{8}$	$\frac{1}{4}$
2	8	$\frac{3}{8}$	2	2	8	4	$2\frac{3}{4}$	4	$1\frac{5}{8}$	$\frac{15}{64}$
2	8	$\frac{3}{8}$	2	2	10	4	$2\frac{3}{4}$	4	$1\frac{5}{8}$	$\frac{7}{32}$
2	8	$\frac{3}{8}$	2	3	0	4	$2\frac{3}{4}$	4	$1\frac{5}{8}$	$\frac{13}{64}$
2	8	$\frac{3}{8}$	2	3	2	4	$2\frac{3}{4}$	4	$1\frac{5}{8}$	$\frac{3}{16}$
2	8	$\frac{3}{8}$	2	3	4	4	$2\frac{3}{4}$	4	$1\frac{5}{8}$	$\frac{3}{16}$
2	8	$\frac{3}{8}$	2	3	6	4	$2\frac{3}{4}$	4	$1\frac{5}{8}$	$\frac{3}{16}$

Inside diameter of Tube, Flue, or Boiler.		Thickness of Plate.	Number of Plates in the Circle.	Breadth of Plate between centres of rivet holes.		Length of straight line between centres of rivet holes of Large end of Plate.		Length of straight line between centres of rivet holes of Small end of Plate.		Versed line.
FT.	IN.	Parts of an Inch.	No.	FT.	IN.	FT.	IN.	FT.	IN.	Parts of an Inch.
2	10	$\frac{3}{8}$	2	2	0	4	$5\frac{7}{8}$	4	$4\frac{3}{4}$	$\frac{5}{16}$
2	10	$\frac{3}{8}$	2	2	2	4	$5\frac{7}{8}$	4	$4\frac{3}{4}$	$\frac{5}{16}$
2	10	$\frac{3}{8}$	2	2	4	4	$5\frac{7}{8}$	4	$4\frac{3}{4}$	$\frac{9}{32}$
2	10	$\frac{3}{8}$	2	2	6	4	$5\frac{7}{8}$	4	$4\frac{3}{4}$	$\frac{1}{4}$
2	10	$\frac{3}{8}$	2	2	8	4	$5\frac{7}{8}$	4	$4\frac{3}{4}$	$\frac{1}{4}$
2	10	$\frac{3}{8}$	2	2	10	4	$5\frac{7}{8}$	4	$4\frac{3}{4}$	$\frac{15}{64}$
2	10	$\frac{3}{8}$	2	3	0	4	$5\frac{7}{8}$	4	$4\frac{3}{4}$	$\frac{7}{32}$
2	10	$\frac{3}{8}$	2	3	2	4	$5\frac{7}{8}$	4	$4\frac{3}{4}$	$\frac{13}{64}$
2	10	$\frac{3}{8}$	2	3	4	4	$5\frac{7}{8}$	4	$4\frac{3}{4}$	$\frac{3}{16}$
2	10	$\frac{3}{8}$	2	3	6	4	$5\frac{7}{8}$	4	$4\frac{3}{4}$	$\frac{3}{16}$
3	0	$\frac{3}{8}$	2	2	0	4	9	4	$7\frac{7}{8}$	$\frac{11}{32}$
3	0	$\frac{3}{8}$	2	2	2	4	9	4	$7\frac{7}{8}$	$\frac{5}{16}$
3	0	$\frac{3}{8}$	2	2	4	4	9	4	$7\frac{7}{8}$	$\frac{19}{64}$
3	0	$\frac{3}{8}$	2	2	6	4	9	4	$7\frac{7}{8}$	$\frac{9}{32}$
3	0	$\frac{3}{8}$	2	2	8	4	9	4	$7\frac{7}{8}$	$\frac{17}{64}$
3	0	$\frac{3}{8}$	2	2	10	4	9	4	$7\frac{7}{8}$	$\frac{1}{4}$
3	0	$\frac{3}{8}$	2	3	0	4	9	4	$7\frac{7}{8}$	$\frac{15}{64}$
3	0	$\frac{3}{8}$	2	3	2	4	9	4	$7\frac{7}{8}$	$\frac{7}{32}$
3	0	$\frac{3}{8}$	2	3	4	4	9	4	$7\frac{7}{8}$	$\frac{13}{64}$
3	0	$\frac{3}{8}$	2	3	6	4	9	4	$7\frac{7}{8}$	$\frac{3}{16}$
3	2	$\frac{3}{8}$	2	2	0	5	$0\frac{1}{8}$	4	11	$\frac{11}{32}$
3	2	$\frac{3}{8}$	2	2	2	5	$0\frac{1}{8}$	4	11	$\frac{11}{32}$
3	2	$\frac{3}{8}$	2	2	4	5	$0\frac{1}{8}$	4	11	$\frac{5}{16}$
3	2	$\frac{3}{8}$	2	2	6	5	$0\frac{1}{8}$	4	11	$\frac{5}{16}$
3	2	$\frac{3}{8}$	2	2	8	5	$0\frac{1}{8}$	4	11	$\frac{17}{64}$
3	2	$\frac{3}{8}$	2	2	10	5	$0\frac{1}{8}$	4	11	$\frac{1}{4}$
3	2	$\frac{3}{8}$	2	3	0	5	$0\frac{1}{8}$	4	11	$\frac{15}{64}$
3	2	$\frac{3}{8}$	2	3	2	5	$0\frac{1}{8}$	4	11	$\frac{7}{32}$
3	2	$\frac{3}{8}$	2	3	4	5	$0\frac{1}{8}$	4	11	$\frac{7}{32}$
3	2	$\frac{3}{8}$	2	3	6	5	$0\frac{1}{8}$	4	11	$\frac{13}{64}$

TEMPLATE MAKING.

Inside diameter of Tube, Flue, or Boiler.		Thickness of Plate.	Number of Plates in the Circle.	Breadth of Plate between centres of rivet holes.		Length of straight line between centres of rivet holes of Large end of Plate.		Length of straight line between centres of rivet holes of Small end of Plate.		Versed line.
FT.	IN.	Parts of an Inch.	No.	FT.	IN.	FT.	IN.	FT.	IN.	Parts of an Inch.
3	4	$\frac{3}{8}$	2	2	0	5	$3\frac{3}{8}$	5	$2\frac{1}{4}$	$\frac{3}{8}$
3	4	$\frac{3}{8}$	2	2	2	5	$3\frac{3}{8}$	5	$2\frac{1}{4}$	$\frac{11}{32}$
3	4	$\frac{3}{8}$	2	2	4	5	$3\frac{3}{8}$	5	$2\frac{1}{4}$	$\frac{11}{32}$
3	4	$\frac{3}{8}$	2	2	6	5	$3\frac{3}{8}$	5	$2\frac{1}{4}$	$\frac{5}{16}$
3	4	$\frac{3}{8}$	2	2	8	5	$3\frac{3}{8}$	5	$2\frac{1}{4}$	$\frac{9}{32}$
3	4	$\frac{3}{8}$	2	2	10	5	$3\frac{3}{8}$	5	$2\frac{1}{4}$	$\frac{7}{16}$
3	4	$\frac{3}{8}$	2	3	0	5	$3\frac{3}{8}$	5	$2\frac{1}{4}$	$\frac{1}{4}$
3	4	$\frac{3}{8}$	2	3	2	5	$3\frac{3}{8}$	5	$2\frac{1}{4}$	$\frac{5}{16}$
3	4	$\frac{3}{8}$	2	3	4	5	$3\frac{3}{8}$	5	$2\frac{1}{4}$	$\frac{7}{32}$
3	4	$\frac{3}{8}$	2	3	6	5	$3\frac{3}{8}$	5	$2\frac{1}{4}$	$\frac{7}{32}$
3	6	$\frac{3}{8}$	2	2	0	5	$6\frac{1}{2}$	5	$5\frac{3}{8}$	$\frac{3}{8}$
3	6	$\frac{3}{8}$	2	2	2	5	$6\frac{1}{2}$	5	$5\frac{3}{8}$	$\frac{11}{32}$
3	6	$\frac{3}{8}$	2	2	4	5	$6\frac{1}{2}$	5	$5\frac{3}{8}$	$\frac{11}{32}$
3	6	$\frac{3}{8}$	2	2	6	5	$6\frac{1}{2}$	5	$5\frac{3}{8}$	$\frac{11}{32}$
3	6	$\frac{3}{8}$	2	2	8	5	$6\frac{1}{2}$	5	$5\frac{3}{8}$	$\frac{5}{16}$
3	6	$\frac{3}{8}$	2	2	10	5	$6\frac{1}{2}$	5	$5\frac{3}{8}$	$\frac{9}{32}$
3	6	$\frac{3}{8}$	2	3	0	5	$6\frac{1}{2}$	5	$5\frac{3}{8}$	$\frac{7}{16}$
3	6	$\frac{3}{8}$	2	3	2	5	$6\frac{1}{2}$	5	$5\frac{3}{8}$	$\frac{1}{4}$
3	6	$\frac{3}{8}$	2	3	4	5	$6\frac{1}{2}$	5	$5\frac{3}{8}$	$\frac{5}{16}$
3	6	$\frac{3}{8}$	2	3	6	5	$6\frac{1}{2}$	5	$5\frac{3}{8}$	$\frac{7}{32}$
3	8	$\frac{3}{8}$	2	2	0	5	$9\frac{5}{8}$	5	$8\frac{1}{2}$	$\frac{7}{16}$
3	8	$\frac{3}{8}$	2	2	2	5	$9\frac{5}{8}$	5	$8\frac{1}{2}$	$\frac{11}{32}$
3	8	$\frac{3}{8}$	2	2	4	5	$9\frac{5}{8}$	5	$8\frac{1}{2}$	$\frac{6}{16}$
3	8	$\frac{3}{8}$	2	2	6	5	$9\frac{5}{8}$	5	$8\frac{1}{2}$	$\frac{11}{32}$
3	8	$\frac{3}{8}$	2	2	8	5	$9\frac{5}{8}$	5	$8\frac{1}{2}$	$\frac{5}{16}$
3	8	$\frac{3}{8}$	2	2	10	5	$9\frac{5}{8}$	5	$8\frac{1}{2}$	$\frac{5}{16}$
3	8	$\frac{3}{8}$	2	3	0	5	$9\frac{5}{8}$	5	$8\frac{1}{2}$	$\frac{9}{32}$
3	8	$\frac{3}{8}$	2	3	2	5	$9\frac{5}{8}$	5	$8\frac{1}{2}$	$\frac{9}{32}$
3	8	$\frac{3}{8}$	2	3	4	5	$9\frac{5}{8}$	5	$8\frac{1}{2}$	$\frac{1}{4}$
3	8	$\frac{3}{8}$	2	3	6	5	$9\frac{5}{8}$	5	$8\frac{1}{2}$	$\frac{1}{4}$

Inside diameter of Tube, Flue, or Boiler.		Thickness of Plate.	Number of Plates in the Circle.	Breadth of Plate between centres of rivet holes.		Length of straight line between centres of rivet holes of Large end of Plate.		Length of straight line between centres of rivet holes of Small end of Plate.		Versed line.
FT.	IN.	Parts of an Inch.	No.	FT.	IN.	FT.	IN.	FT.	IN.	Parts of an Inch.
3	10	$\frac{3}{8}$	2	2	0	6	$0\frac{3}{4}$	5	$11\frac{5}{8}$	$\frac{7}{16}$
3	10	$\frac{3}{8}$	2	2	2	6	$0\frac{3}{4}$	5	$11\frac{5}{8}$	$\frac{13}{32}$
3	10	$\frac{3}{8}$	2	2	4	6	$0\frac{3}{4}$	5	$11\frac{5}{8}$	$\frac{3}{8}$
3	10	$\frac{3}{8}$	2	2	6	6	$0\frac{3}{4}$	5	$11\frac{5}{8}$	$\frac{11}{32}$
3	10	$\frac{3}{8}$	2	2	8	6	$0\frac{3}{4}$	5	$11\frac{5}{8}$	$\frac{11}{32}$
3	10	$\frac{3}{8}$	2	2	10	6	$0\frac{3}{4}$	5	$11\frac{5}{8}$	$\frac{5}{16}$
3	10	$\frac{3}{8}$	2	3	0	6	$0\frac{3}{4}$	5	$11\frac{5}{8}$	$\frac{9}{32}$
3	10	$\frac{3}{8}$	2	3	2	6	$0\frac{3}{4}$	5	$11\frac{5}{8}$	$\frac{9}{32}$
3	10	$\frac{3}{8}$	2	3	4	6	$0\frac{3}{4}$	5	$11\frac{5}{8}$	$\frac{1}{4}$
3	10	$\frac{3}{8}$	2	3	6	6	$0\frac{3}{4}$	5	$11\frac{5}{8}$	$\frac{1}{4}$
4	0	$\frac{3}{8}$	2	2	0	6	$3\frac{7}{8}$	6	$2\frac{3}{4}$	$\frac{15}{32}$
4	0	$\frac{3}{8}$	2	2	2	6	$3\frac{7}{8}$	6	$2\frac{3}{4}$	$\frac{7}{16}$
4	0	$\frac{3}{8}$	2	2	4	6	$3\frac{7}{8}$	6	$2\frac{3}{4}$	$\frac{13}{32}$
4	0	$\frac{3}{8}$	2	2	6	6	$3\frac{7}{8}$	6	$2\frac{3}{4}$	$\frac{3}{8}$
4	0	$\frac{3}{8}$	2	2	8	6	$3\frac{7}{8}$	6	$2\frac{3}{4}$	$\frac{11}{32}$
4	0	$\frac{3}{8}$	2	2	10	6	$3\frac{7}{8}$	6	$2\frac{3}{4}$	$\frac{11}{32}$
4	0	$\frac{3}{8}$	2	3	0	6	$3\frac{7}{8}$	6	$2\frac{3}{4}$	$\frac{5}{16}$
4	0	$\frac{3}{8}$	2	3	2	6	$3\frac{7}{8}$	6	$2\frac{3}{4}$	$\frac{5}{16}$
4	0	$\frac{3}{8}$	2	3	4	6	$3\frac{7}{8}$	6	$2\frac{3}{4}$	$\frac{9}{32}$
4	0	$\frac{3}{8}$	2	3	6	6	$3\frac{7}{8}$	6	$2\frac{3}{4}$	$\frac{9}{32}$
3	0	$\frac{3}{8}$	3	2	0	3	$2\frac{1}{16}$	3	$1\frac{1}{4}$	$\frac{5}{32}$
3	0	$\frac{3}{8}$	3	2	2	3	$2\frac{1}{16}$	3	$1\frac{1}{4}$	$\frac{9}{64}$
3	0	$\frac{3}{8}$	3	2	4	3	$2\frac{1}{16}$	3	$1\frac{1}{4}$	$\frac{4}{32}$
3	0	$\frac{3}{8}$	3	2	6	3	$2\frac{1}{16}$	3	$1\frac{1}{4}$	$\frac{4}{32}$
3	0	$\frac{3}{8}$	3	2	8	3	$2\frac{1}{16}$	3	$1\frac{1}{4}$	$\frac{7}{64}$
3	0	$\frac{3}{8}$	3	2	10	3	$2\frac{1}{16}$	3	$1\frac{1}{4}$	$\frac{7}{64}$
3	0	$\frac{3}{8}$	3	3	0	3	$2\frac{1}{16}$	3	$1\frac{1}{4}$	$\frac{3}{32}$
3	0	$\frac{3}{8}$	3	3	2	3	$2\frac{1}{16}$	3	$1\frac{1}{4}$	$\frac{3}{32}$
3	0	$\frac{3}{8}$	3	3	4	3	$2\frac{1}{16}$	3	$1\frac{1}{4}$	$\frac{3}{32}$
3	0	$\frac{3}{8}$	3	3	6	3	$2\frac{1}{16}$	3	$1\frac{1}{4}$	$\frac{3}{32}$

Inside diameter of Tube, Flue, or Boiler.		Thickness of Plate.	Number of Plates in the Circle.	Breadth of Plate between centres of rivet holes.		Length of straight line between centres of rivet holes of Large end of Plate.		Length of straight line between centres of rivet holes of Small end of Plate.		Versed line.
FT.	IN.	Parts of an Inch.	No.	FT.	IN.	FT.	IN.	FT.	IN.	Parts of an Inch.
3	2	$\frac{3}{8}$	3	2	0	3	$4\frac{1}{8}$	3	$3\frac{3}{8}$	$\frac{5}{32}$
3	2	$\frac{3}{8}$	3	2	2	3	$4\frac{1}{8}$	3	$3\frac{3}{8}$	$\frac{5}{32}$
3	2	$\frac{3}{8}$	3	2	4	3	$4\frac{1}{8}$	3	$3\frac{3}{8}$	$\frac{9}{64}$
3	2	$\frac{3}{8}$	3	2	6	3	$4\frac{1}{8}$	3	$3\frac{3}{8}$	$\frac{4}{32}$
3	2	$\frac{3}{8}$	3	2	8	3	$4\frac{1}{8}$	3	$3\frac{3}{8}$	$\frac{4}{32}$
3	2	$\frac{3}{8}$	3	2	10	3	$4\frac{1}{8}$	3	$3\frac{3}{8}$	$\frac{7}{64}$
3	2	$\frac{3}{8}$	3	3	0	3	$4\frac{1}{8}$	3	$3\frac{3}{8}$	$\frac{7}{64}$
3	2	$\frac{3}{8}$	3	3	2	3	$4\frac{1}{8}$	3	$3\frac{3}{8}$	$\frac{7}{64}$
3	2	$\frac{3}{8}$	3	3	4	3	$4\frac{1}{8}$	3	$3\frac{3}{8}$	$\frac{3}{32}$
3	2	$\frac{3}{8}$	3	3	6	3	$4\frac{1}{8}$	3	$3\frac{3}{8}$	$\frac{3}{32}$
3	4	$\frac{3}{8}$	3	2	0	3	$6\frac{1}{4}$	3	$5\frac{3}{8}$	$\frac{11}{64}$
3	4	$\frac{3}{8}$	3	2	2	3	$6\frac{1}{4}$	3	$5\frac{3}{8}$	$\frac{5}{32}$
3	4	$\frac{3}{8}$	3	2	4	3	$6\frac{1}{4}$	3	$5\frac{3}{8}$	$\frac{9}{64}$
3	4	$\frac{3}{8}$	3	2	6	3	$6\frac{1}{4}$	3	$5\frac{3}{8}$	$\frac{9}{64}$
3	4	$\frac{3}{8}$	3	2	8	3	$6\frac{1}{4}$	3	$5\frac{3}{8}$	$\frac{4}{32}$
3	4	$\frac{3}{8}$	3	2	10	3	$6\frac{1}{4}$	3	$5\frac{3}{8}$	$\frac{4}{32}$
3	4	$\frac{3}{8}$	3	3	0	3	$6\frac{1}{4}$	3	$5\frac{3}{8}$	$\frac{7}{64}$
3	4	$\frac{3}{8}$	3	3	2	3	$6\frac{1}{4}$	3	$5\frac{3}{8}$	$\frac{7}{64}$
3	4	$\frac{3}{8}$	3	3	4	3	$6\frac{1}{4}$	3	$5\frac{3}{8}$	$\frac{3}{32}$
3	4	$\frac{3}{8}$	3	3	6	3	$6\frac{1}{4}$	3	$5\frac{3}{8}$	$\frac{3}{32}$
3	6	$\frac{3}{8}$	3	2	0	3	$8\frac{3}{8}$	3	$7\frac{9}{16}$	$\frac{3}{16}$
3	6	$\frac{3}{8}$	3	2	2	3	$8\frac{3}{8}$	3	$7\frac{9}{16}$	$\frac{11}{64}$
3	6	$\frac{3}{8}$	3	2	4	3	$8\frac{3}{8}$	3	$7\frac{9}{16}$	$\frac{5}{32}$
3	6	$\frac{3}{8}$	3	2	6	3	$8\frac{3}{8}$	3	$7\frac{9}{16}$	$\frac{9}{64}$
3	6	$\frac{3}{8}$	3	2	8	3	$8\frac{3}{8}$	3	$7\frac{9}{16}$	$\frac{9}{64}$
3	6	$\frac{3}{8}$	3	2	10	3	$8\frac{3}{8}$	3	$7\frac{9}{16}$	$\frac{4}{32}$
3	6	$\frac{3}{8}$	3	3	0	3	$8\frac{3}{8}$	3	$7\frac{9}{16}$	$\frac{4}{32}$
3	6	$\frac{3}{8}$	3	3	2	3	$8\frac{3}{8}$	3	$7\frac{9}{16}$	$\frac{7}{64}$
3	6	$\frac{3}{8}$	3	3	4	3	$8\frac{3}{8}$	3	$7\frac{9}{16}$	$\frac{7}{64}$
3	6	$\frac{3}{8}$	3	3	6	3	$8\frac{3}{8}$	3	$7\frac{9}{16}$	$\frac{7}{64}$

Inside diameter of Tube, Flue, or Boiler.		Thickness of Plate	Number of Plates in the Circle.	Breadth of Plate between centres of rivet holes.		Length of straight line between centres of rivet holes of Large end of Plate.		Length of straight line between centres of rivet holes of Small end of Plate.		Versed line.
FT.	IN.	Parts of an Inch.	No.	FT.	IN.	FT.	IN.	FT.	IN.	Parts of an Inch.
3	8	$\frac{3}{8}$	3	2	0	3	$10\frac{3}{8}$	3	$9\frac{5}{8}$	$\frac{3}{16}$
3	8	$\frac{3}{8}$	3	2	2	3	$10\frac{3}{8}$	3	$9\frac{5}{8}$	$\frac{11}{64}$
3	8	$\frac{3}{8}$	3	2	4	3	$10\frac{3}{8}$	3	$9\frac{5}{8}$	$\frac{5}{32}$
3	8	$\frac{3}{8}$	3	2	6	3	$10\frac{3}{8}$	3	$9\frac{5}{8}$	$\frac{9}{64}$
3	8	$\frac{3}{8}$	3	2	8	3	$10\frac{3}{8}$	3	$9\frac{5}{8}$	$\frac{9}{64}$
3	8	$\frac{3}{8}$	3	2	10	3	$10\frac{3}{8}$	3	$9\frac{5}{8}$	$\frac{4}{32}$
3	8	$\frac{3}{8}$	3	3	0	3	$10\frac{3}{8}$	3	$9\frac{5}{8}$	$\frac{4}{32}$
3	8	$\frac{3}{8}$	3	3	2	3	$10\frac{3}{8}$	3	$9\frac{5}{8}$	$\frac{7}{64}$
3	8	$\frac{3}{8}$	3	3	4	3	$10\frac{3}{8}$	3	$9\frac{5}{8}$	$\frac{7}{64}$
3	8	$\frac{3}{8}$	3	3	6	3	$10\frac{3}{8}$	3	$9\frac{5}{8}$	$\frac{7}{64}$
3	10	$\frac{3}{8}$	3	2	0	4	$0\frac{1}{2}$	3	$11\frac{3}{4}$	$\frac{13}{64}$
3	10	$\frac{3}{8}$	3	2	2	4	$0\frac{1}{2}$	3	$11\frac{3}{4}$	$\frac{3}{16}$
3	10	$\frac{3}{8}$	3	2	4	4	$0\frac{1}{2}$	3	$11\frac{3}{4}$	$\frac{11}{64}$
3	10	$\frac{3}{8}$	3	2	6	4	$0\frac{1}{2}$	3	$11\frac{3}{4}$	$\frac{5}{32}$
3	10	$\frac{3}{8}$	3	2	8	4	$0\frac{1}{2}$	3	$11\frac{3}{4}$	$\frac{9}{64}$
3	10	$\frac{3}{8}$	3	2	10	4	$0\frac{1}{2}$	3	$11\frac{3}{4}$	$\frac{9}{64}$
3	10	$\frac{3}{8}$	3	3	0	4	$0\frac{1}{2}$	3	$11\frac{3}{4}$	$\frac{4}{32}$
3	10	$\frac{3}{8}$	3	3	2	4	$0\frac{1}{2}$	3	$11\frac{3}{4}$	$\frac{4}{32}$
3	10	$\frac{3}{8}$	3	3	4	4	$0\frac{1}{2}$	3	$11\frac{3}{4}$	$\frac{4}{32}$
3	10	$\frac{3}{8}$	3	3	6	4	$0\frac{1}{2}$	3	$11\frac{3}{4}$	$\frac{7}{64}$
4	0	$\frac{3}{8}$	3	2	0	4	$2\frac{5}{8}$	4	$1\frac{7}{8}$	$\frac{13}{64}$
4	0	$\frac{3}{8}$	3	2	2	4	$2\frac{5}{8}$	4	$1\frac{7}{8}$	$\frac{3}{16}$
4	0	$\frac{3}{8}$	3	2	4	4	$2\frac{5}{8}$	4	$1\frac{7}{8}$	$\frac{11}{64}$
4	0	$\frac{3}{8}$	3	2	6	4	$2\frac{5}{8}$	4	$1\frac{7}{8}$	$\frac{5}{32}$
4	0	$\frac{3}{8}$	3	2	8	4	$2\frac{5}{8}$	4	$1\frac{7}{8}$	$\frac{5}{32}$
4	0	$\frac{3}{8}$	3	2	10	4	$2\frac{5}{8}$	4	$1\frac{7}{8}$	$\frac{5}{32}$
4	0	$\frac{3}{8}$	3	3	0	4	$2\frac{5}{8}$	4	$1\frac{7}{8}$	$\frac{9}{64}$
4	0	$\frac{3}{8}$	3	3	2	4	$2\frac{5}{8}$	4	$1\frac{7}{8}$	$\frac{4}{32}$
4	0	$\frac{3}{8}$	3	3	4	4	$2\frac{5}{8}$	4	$1\frac{7}{8}$	$\frac{4}{32}$
4	0	$\frac{3}{8}$	3	3	6	4	$2\frac{5}{8}$	4	$1\frac{7}{8}$	$\frac{4}{32}$

TEMPLATE MAKING.

Inside diameter of Tube, Flue, or Boiler.		Thickness of Plate	Number of Plates in the Circle.	Breadth of Plate between centres of rivet holes.		Length of straight line between centres of rivet holes of Large end of Plate.		Length of straight line between centres of rivet holes of Small end of Plate.		Versed line.
FT.	IN.	Parts of an Inch.	No.	FT.	IN.	FT.	IN.	FT.	IN.	Parts of an Inch.
4	2	$\frac{3}{8}$	3	2	0	4	$4\frac{3}{4}$	4	$3\frac{15}{16}$	$\frac{7}{32}$
4	2	$\frac{3}{8}$	3	2	2	4	$4\frac{3}{4}$	4	$3\frac{15}{16}$	$\frac{13}{64}$
4	2	$\frac{3}{8}$	3	2	4	4	$4\frac{3}{4}$	4	$3\frac{15}{16}$	$\frac{3}{16}$
4	2	$\frac{3}{8}$	3	2	6	4	$4\frac{3}{4}$	4	$3\frac{15}{16}$	$\frac{11}{64}$
4	2	$\frac{3}{8}$	3	2	8	4	$4\frac{3}{4}$	4	$3\frac{15}{16}$	$\frac{5}{32}$
4	2	$\frac{3}{8}$	3	2	10	4	$4\frac{3}{4}$	4	$3\frac{15}{16}$	$\frac{5}{32}$
4	2	$\frac{3}{8}$	3	3	0	4	$4\frac{3}{4}$	4	$3\frac{15}{16}$	$\frac{9}{32}$
4	2	$\frac{3}{8}$	3	3	2	4	$4\frac{3}{4}$	4	$3\frac{15}{16}$	$\frac{9}{64}$
4	2	$\frac{3}{8}$	3	3	4	4	$4\frac{3}{4}$	4	$3\frac{15}{16}$	$\frac{9}{64}$
4	2	$\frac{3}{8}$	3	3	6	4	$4\frac{3}{4}$	4	$3\frac{15}{16}$	$\frac{4}{32}$
4	4	$\frac{3}{8}$	3	2	0	4	$6\frac{13}{16}$	4	6	$\frac{7}{32}$
4	4	$\frac{3}{8}$	3	2	2	4	$6\frac{13}{16}$	4	6	$\frac{13}{64}$
4	4	$\frac{3}{8}$	3	2	4	4	$6\frac{13}{16}$	4	6	$\frac{3}{16}$
4	4	$\frac{3}{8}$	3	2	6	4	$6\frac{13}{16}$	4	6	$\frac{11}{64}$
4	4	$\frac{3}{8}$	3	2	8	4	$6\frac{13}{16}$	4	6	$\frac{5}{32}$
4	4	$\frac{3}{8}$	3	2	10	4	$6\frac{13}{16}$	4	6	$\frac{5}{32}$
4	4	$\frac{3}{8}$	3	3	0	4	$6\frac{13}{16}$	4	6	$\frac{9}{64}$
4	4	$\frac{3}{8}$	3	3	2	4	$6\frac{13}{16}$	4	6	$\frac{9}{64}$
4	4	$\frac{3}{8}$	3	3	4	4	$6\frac{13}{16}$	4	6	$\frac{4}{32}$
4	4	$\frac{3}{8}$	3	3	6	4	$6\frac{13}{16}$	4	6	$\frac{4}{32}$
4	6	$\frac{3}{8}$	3	2	0	4	$8\frac{7}{8}$	4	$8\frac{1}{8}$	$\frac{7}{32}$
4	6	$\frac{3}{8}$	3	2	2	4	$8\frac{7}{8}$	4	$8\frac{1}{8}$	$\frac{13}{64}$
4	6	$\frac{3}{8}$	3	2	4	4	$8\frac{7}{8}$	4	$8\frac{1}{8}$	$\frac{3}{16}$
4	6	$\frac{3}{8}$	3	2	6	4	$8\frac{7}{8}$	4	$8\frac{1}{8}$	$\frac{11}{64}$
4	6	$\frac{3}{8}$	3	2	8	4	$8\frac{7}{8}$	4	$8\frac{1}{8}$	$\frac{11}{64}$
4	6	$\frac{3}{8}$	3	2	10	4	$8\frac{7}{8}$	4	$8\frac{1}{8}$	$\frac{5}{32}$
4	6	$\frac{3}{8}$	3	3	0	4	$8\frac{7}{8}$	4	$8\frac{1}{8}$	$\frac{5}{32}$
4	6	$\frac{3}{8}$	3	3	2	4	$8\frac{7}{8}$	4	$8\frac{1}{8}$	$\frac{9}{64}$
4	6	$\frac{3}{8}$	3	3	4	4	$8\frac{7}{8}$	4	$8\frac{1}{8}$	$\frac{9}{64}$
4	6	$\frac{3}{8}$	3	3	6	4	$8\frac{7}{8}$	4	$8\frac{1}{8}$	$\frac{4}{32}$

Inside diameter of Tube, Flue, or Boiler.		Thickness of Plate	Number of Plates in the Circle.	Breadth of Plate between centres of rivet holes.		Length of straight line between centres of rivet holes of Large end of Plate.		Length of straight line between centres of rivet holes of Small end of Plate.		Versed line.
FT.	IN.	Parts of an Inch.	No.	FT.	IN.	FT.	IN.	FT.	IN.	Parts of an Inch.
4	8	$\frac{3}{8}$	3	2	0	4	11	4	$10\frac{1}{8}$	$\frac{15}{64}$
4	8	$\frac{3}{8}$	3	2	2	4	11	4	$10\frac{1}{8}$	$\frac{7}{32}$
4	8	$\frac{3}{8}$	3	2	4	4	11	4	$10\frac{1}{8}$	$\frac{13}{64}$
4	8	$\frac{3}{8}$	3	2	6	4	11	4	$10\frac{1}{8}$	$\frac{3}{16}$
4	8	$\frac{3}{8}$	3	2	8	4	11	4	$10\frac{1}{8}$	$\frac{3}{16}$
4	8	$\frac{3}{8}$	3	2	10	4	11	4	$10\frac{1}{8}$	$\frac{11}{64}$
4	8	$\frac{3}{8}$	3	3	0	4	11	4	$10\frac{1}{8}$	$\frac{5}{32}$
4	8	$\frac{3}{8}$	3	3	2	4	11	4	$10\frac{1}{8}$	$\frac{5}{32}$
4	8	$\frac{3}{8}$	3	3	4	4	11	4	$10\frac{1}{8}$	$\frac{9}{64}$
4	8	$\frac{3}{8}$	3	3	6	4	11	4	$10\frac{1}{8}$	$\frac{9}{64}$
4	10	$\frac{3}{8}$	3	2	0	5	$1\frac{1}{8}$	5	$0\frac{5}{16}$	$\frac{1}{4}$
4	10	$\frac{3}{8}$	3	2	2	5	$1\frac{1}{8}$	5	$0\frac{5}{16}$	$\frac{7}{32}$
4	10	$\frac{3}{8}$	3	2	4	5	$1\frac{1}{8}$	5	$0\frac{5}{16}$	$\frac{7}{32}$
4	10	$\frac{3}{8}$	3	2	6	5	$1\frac{1}{8}$	5	$0\frac{5}{16}$	$\frac{13}{64}$
4	10	$\frac{3}{8}$	3	2	8	5	$1\frac{1}{8}$	5	$0\frac{5}{16}$	$\frac{3}{16}$
4	10	$\frac{3}{8}$	3	2	10	5	$1\frac{1}{8}$	5	$0\frac{5}{16}$	$\frac{11}{32}$
4	10	$\frac{3}{8}$	3	3	0	5	$1\frac{1}{8}$	5	$0\frac{5}{16}$	$\frac{11}{32}$
4	10	$\frac{3}{8}$	3	3	2	5	$1\frac{1}{8}$	5	$0\frac{5}{16}$	$\frac{5}{32}$
4	10	$\frac{3}{8}$	3	3	4	5	$1\frac{1}{8}$	5	$0\frac{5}{16}$	$\frac{9}{64}$
4	10	$\frac{3}{8}$	3	3	6	5	$1\frac{1}{8}$	5	$0\frac{5}{16}$	$\frac{9}{64}$
5	0	$\frac{3}{8}$	3	2	0	5	$3\frac{3}{16}$	5	$2\frac{3}{8}$	$\frac{1}{4}$
5	0	$\frac{3}{8}$	3	2	2	5	$3\frac{3}{16}$	5	$2\frac{3}{8}$	$\frac{15}{64}$
5	0	$\frac{3}{8}$	3	2	4	5	$3\frac{3}{16}$	5	$2\frac{3}{8}$	$\frac{7}{32}$
5	0	$\frac{3}{8}$	3	2	6	5	$3\frac{3}{16}$	5	$2\frac{3}{8}$	$\frac{13}{64}$
5	0	$\frac{3}{8}$	3	2	8	5	$3\frac{3}{16}$	5	$2\frac{3}{8}$	$\frac{3}{16}$
5	0	$\frac{3}{8}$	3	2	10	5	$3\frac{3}{16}$	5	$2\frac{3}{8}$	$\frac{11}{64}$
5	0	$\frac{3}{8}$	3	3	0	5	$3\frac{3}{16}$	5	$2\frac{3}{8}$	$\frac{11}{64}$
5	0	$\frac{3}{8}$	3	3	2	5	$3\frac{3}{16}$	5	$2\frac{3}{8}$	$\frac{5}{32}$
5	0	$\frac{3}{8}$	3	3	4	5	$3\frac{3}{16}$	5	$2\frac{3}{8}$	$\frac{5}{32}$
5	0	$\frac{3}{8}$	3	3	6	5	$3\frac{3}{16}$	5	$2\frac{3}{8}$	$\frac{9}{64}$

Inside diameter of Tube, Flue, or Boiler.		Thickness of Plate	Number of Plates in the Circle.	Breadth of Plate between centres of rivet holes.		Length of straight line between centres of rivet holes of Large end of Plate.		Length of straight line between centres of rivet holes of Small end of Plate.		Versed line.
FT.	IN.	Parts of an Inch.	No.	FT.	IN.	FT.	IN.	FT.	IN.	Parts of an Inch.
5	2	$\frac{3}{8}$	3	2	0	5	$5\frac{1}{4}$	5	$4\frac{1}{2}$	$\frac{17}{64}$
5	2	$\frac{3}{8}$	3	2	2	5	$5\frac{1}{4}$	5	$4\frac{1}{2}$	$\frac{1}{4}$
5	2	$\frac{3}{8}$	3	2	4	5	$5\frac{1}{4}$	5	$4\frac{1}{2}$	$\frac{15}{64}$
5	2	$\frac{3}{8}$	3	2	6	5	$5\frac{1}{4}$	5	$4\frac{1}{2}$	$\frac{7}{32}$
5	2	$\frac{3}{8}$	3	2	8	5	$5\frac{1}{4}$	5	$4\frac{1}{2}$	$\frac{13}{64}$
5	2	$\frac{3}{8}$	3	2	10	5	$5\frac{1}{4}$	5	$4\frac{1}{2}$	$\frac{3}{16}$
5	2	$\frac{3}{8}$	3	3	0	5	$5\frac{1}{4}$	5	$4\frac{1}{2}$	$\frac{3}{16}$
5	4	$\frac{3}{8}$	3	2	0	5	$7\frac{3}{8}$	5	$6\frac{5}{8}$	$\frac{17}{64}$
5	4	$\frac{3}{8}$	3	2	2	5	$7\frac{3}{8}$	5	$6\frac{5}{8}$	$\frac{1}{4}$
5	4	$\frac{3}{8}$	3	2	4	5	$7\frac{3}{8}$	5	$6\frac{5}{8}$	$\frac{15}{16}$
5	4	$\frac{3}{8}$	3	2	6	5	$7\frac{3}{8}$	5	$6\frac{5}{8}$	$\frac{7}{32}$
5	4	$\frac{3}{8}$	3	2	8	5	$7\frac{3}{8}$	5	$6\frac{5}{8}$	$\frac{13}{64}$
5	4	$\frac{3}{8}$	3	2	10	5	$7\frac{3}{8}$	5	$6\frac{5}{8}$	$\frac{3}{16}$
5	4	$\frac{3}{8}$	3	3	0	5	$7\frac{3}{8}$	5	$6\frac{5}{8}$	$\frac{3}{16}$
5	6	$\frac{3}{8}$	3	2	0	5	$9\frac{1}{2}$	5	$8\frac{5}{8}$	$\frac{9}{32}$
5	6	$\frac{3}{8}$	3	2	2	5	$9\frac{1}{2}$	5	$8\frac{5}{8}$	$\frac{17}{64}$
5	6	$\frac{3}{8}$	3	2	4	5	$9\frac{1}{2}$	5	$8\frac{5}{8}$	$\frac{1}{4}$
5	6	$\frac{3}{8}$	3	2	6	5	$9\frac{1}{2}$	5	$8\frac{5}{8}$	$\frac{15}{64}$
5	6	$\frac{3}{8}$	3	2	8	5	$9\frac{1}{2}$	5	$8\frac{5}{8}$	$\frac{7}{32}$
5	6	$\frac{3}{8}$	3	2	10	5	$9\frac{1}{2}$	5	$8\frac{5}{8}$	$\frac{13}{64}$
5	6	$\frac{3}{8}$	3	3	0	5	$9\frac{1}{2}$	5	$8\frac{5}{8}$	$\frac{3}{16}$
5	8	$\frac{3}{8}$	3	2	0	5	$11\frac{1}{2}$	5	$10\frac{3}{4}$	$\frac{9}{32}$
5	8	$\frac{3}{8}$	3	2	2	5	$11\frac{1}{2}$	5	$10\frac{3}{4}$	$\frac{17}{64}$
5	8	$\frac{3}{8}$	3	2	4	5	$11\frac{1}{2}$	5	$10\frac{3}{4}$	$\frac{1}{4}$
5	8	$\frac{3}{8}$	3	2	6	5	$11\frac{1}{2}$	5	$10\frac{3}{4}$	$\frac{15}{64}$
5	8	$\frac{3}{8}$	3	2	8	5	$11\frac{1}{2}$	5	$10\frac{3}{4}$	$\frac{7}{32}$
5	8	$\frac{3}{8}$	3	2	10	5	$11\frac{1}{2}$	5	$10\frac{3}{4}$	$\frac{13}{64}$
5	8	$\frac{3}{8}$	3	3	0	5	$11\frac{1}{2}$	5	$10\frac{3}{4}$	$\frac{3}{16}$
5	10	$\frac{3}{8}$	3	2	0	6	$1\frac{5}{8}$	6	$0\frac{7}{8}$	$\frac{19}{64}$
5	10	$\frac{3}{8}$	3	2	2	6	$1\frac{5}{8}$	6	$0\frac{7}{8}$	$\frac{9}{32}$

Inside diameter of Tube, Flue, or Boiler.		Thickness of Plate	Number of Plates in the Circle.	Breadth of Plate between centres of rivet holes.		Length of straight line between centres of rivet holes of Large end of Plate.		Length of straight line between centres of rivet holes of Small end of Plate.		Versed line.
FT.	IN.	Parts of an Inch.	No.	FT.	IN.	FT.	IN.	FT.	IN.	Parts of an Inch.
5	10	$\frac{3}{8}$	3	2	4	6	$1\frac{5}{8}$	6	$0\frac{7}{8}$	$\frac{17}{64}$
5	10	$\frac{3}{8}$	3	2	6	6	$1\frac{5}{8}$	6	$0\frac{7}{8}$	$\frac{1}{4}$
5	10	$\frac{3}{8}$	3	2	8	6	$1\frac{5}{8}$	6	$0\frac{7}{8}$	$\frac{15}{64}$
5	10	$\frac{3}{8}$	3	2	10	6	$1\frac{5}{8}$	6	$0\frac{7}{8}$	$\frac{7}{32}$
5	10	$\frac{3}{8}$	3	3	0	6	$1\frac{5}{8}$	6	$0\frac{7}{8}$	$\frac{13}{64}$
6	0	$\frac{3}{8}$	3	2	0	6	$3\frac{3}{4}$	6	3	$\frac{19}{64}$
6	0	$\frac{3}{8}$	3	2	2	6	$3\frac{3}{4}$	6	3	$\frac{9}{32}$
6	0	$\frac{3}{8}$	3	2	4	6	$3\frac{3}{4}$	6	3	$\frac{17}{64}$
6	0	$\frac{3}{8}$	3	2	6	6	$3\frac{3}{4}$	6	3	$\frac{1}{4}$
6	0	$\frac{3}{8}$	3	2	8	6	$3\frac{3}{4}$	6	3	$\frac{15}{64}$
6	0	$\frac{3}{8}$	3	2	10	6	$3\frac{3}{4}$	6	3	$\frac{7}{32}$
6	0	$\frac{3}{8}$	3	3	0	6	$3\frac{3}{4}$	6	3	$\frac{13}{64}$
2	0	$\frac{7}{16}$	2	2	0	3	$2\frac{3}{8}$	3	1	$\frac{17}{64}$
2	0	$\frac{7}{16}$	2	2	2	3	$2\frac{3}{8}$	3	1	$\frac{1}{4}$
2	0	$\frac{7}{16}$	2	2	4	3	$2\frac{3}{8}$	3	1	$\frac{15}{64}$
2	0	$\frac{7}{16}$	2	2	6	3	$2\frac{3}{8}$	3	1	$\frac{7}{32}$
2	0	$\frac{7}{16}$	2	2	8	3	$2\frac{3}{8}$	3	1	$\frac{13}{64}$
2	0	$\frac{7}{16}$	2	2	10	3	$2\frac{3}{8}$	3	1	$\frac{3}{16}$
2	0	$\frac{7}{16}$	2	3	0	3	$2\frac{3}{8}$	3	1	$\frac{11}{64}$
2	2	$\frac{7}{16}$	2	2	0	3	$5\frac{1}{2}$	3	$4\frac{1}{8}$	$\frac{9}{32}$
2	2	$\frac{7}{16}$	2	2	2	3	$5\frac{1}{2}$	3	$4\frac{1}{8}$	$\frac{17}{64}$
2	2	$\frac{7}{16}$	2	2	4	3	$5\frac{1}{2}$	3	$4\frac{1}{8}$	$\frac{1}{4}$
2	2	$\frac{7}{16}$	2	2	6	3	$5\frac{1}{2}$	3	$4\frac{1}{8}$	$\frac{15}{64}$
2	2	$\frac{7}{16}$	2	2	8	3	$5\frac{1}{2}$	3	$4\frac{1}{8}$	$\frac{7}{32}$
2	2	$\frac{7}{16}$	2	2	10	3	$5\frac{1}{2}$	3	$4\frac{1}{8}$	$\frac{13}{64}$
2	2	$\frac{7}{16}$	2	3	0	3	$5\frac{1}{2}$	3	$4\frac{1}{8}$	$\frac{3}{16}$
2	4	$\frac{7}{16}$	2	2	0	3	$8\frac{5}{8}$	3	$7\frac{1}{4}$	$\frac{5}{16}$
2	4	$\frac{7}{16}$	2	2	2	3	$8\frac{5}{8}$	3	$7\frac{1}{4}$	$\frac{19}{64}$
2	4	$\frac{7}{16}$	2	2	4	3	$8\frac{5}{8}$	3	$7\frac{1}{4}$	$\frac{9}{32}$
2	4	$\frac{7}{16}$	2	2	6	3	$8\frac{5}{8}$	3	$7\frac{1}{4}$	$\frac{17}{64}$

Inside diameter of Tube, Flue, or Boiler.		Thickness of Plate	Number of Plates in the Circle.	Breadth of Plate between centres of rivet holes.		Length of straight line between centres of rivet holes of Large end of Plate.		Length of straight line between centres of rivet holes of Small end of Plate.		Versed line.
FT.	IN.	Parts of an Inch.	No.	FT.	IN.	FT.	IN.	FT.	IN.	Parts of an Inch.
2	4	$\frac{7}{16}$	2	2	8	3	$8\frac{5}{8}$	3	$7\frac{1}{4}$	$\frac{1}{4}$
2	4	$\frac{7}{16}$	2	2	10	3	$8\frac{5}{8}$	3	$7\frac{1}{4}$	$\frac{15}{64}$
2	4	$\frac{7}{16}$	2	3	0	3	$8\frac{5}{8}$	3	$7\frac{1}{4}$	$\frac{7}{32}$
2	6	$\frac{7}{16}$	2	2	0	3	$11\frac{3}{4}$	3	$10\frac{3}{8}$	$\frac{5}{16}$
2	6	$\frac{7}{16}$	2	2	2	3	$11\frac{3}{4}$	3	$10\frac{3}{8}$	$\frac{19}{64}$
2	6	$\frac{7}{16}$	2	2	4	3	$11\frac{3}{4}$	3	$10\frac{3}{8}$	$\frac{9}{32}$
2	6	$\frac{7}{16}$	2	2	6	3	$11\frac{3}{4}$	3	$10\frac{3}{8}$	$\frac{17}{64}$
2	6	$\frac{7}{16}$	2	2	8	3	$11\frac{3}{4}$	3	$10\frac{3}{8}$	$\frac{1}{4}$
2	6	$\frac{7}{16}$	2	2	10	3	$11\frac{3}{4}$	3	$10\frac{3}{8}$	$\frac{15}{64}$
2	6	$\frac{7}{16}$	2	3	0	3	$11\frac{3}{4}$	3	$10\frac{3}{8}$	$\frac{7}{32}$
2	8	$\frac{7}{16}$	2	2	0	4	$2\frac{7}{8}$	4	$1\frac{1}{2}$	$\frac{11}{32}$
2	8	$\frac{7}{16}$	2	2	2	4	$2\frac{7}{8}$	4	$1\frac{1}{2}$	$\frac{21}{64}$
2	8	$\frac{7}{16}$	2	2	4	4	$2\frac{7}{8}$	4	$1\frac{1}{2}$	$\frac{5}{16}$
2	8	$\frac{7}{16}$	2	2	6	4	$2\frac{7}{8}$	4	$1\frac{1}{2}$	$\frac{19}{64}$
2	8	$\frac{7}{16}$	2	2	8	4	$2\frac{7}{8}$	4	$1\frac{1}{2}$	$\frac{9}{32}$
2	8	$\frac{7}{16}$	2	2	10	4	$2\frac{7}{8}$	4	$1\frac{1}{2}$	$\frac{17}{64}$
2	8	$\frac{7}{16}$	2	3	0	4	$2\frac{7}{8}$	4	$1\frac{1}{2}$	$\frac{1}{4}$
2	10	$\frac{7}{16}$	2	2	0	4	6	4	$4\frac{5}{8}$	$\frac{23}{64}$
2	10	$\frac{7}{16}$	2	2	2	4	6	4	$4\frac{5}{8}$	$\frac{11}{32}$
2	10	$\frac{7}{16}$	2	2	4	4	6	4	$4\frac{5}{8}$	$\frac{21}{64}$
2	10	$\frac{7}{16}$	2	2	6	4	6	4	$4\frac{5}{8}$	$\frac{5}{16}$
2	10	$\frac{7}{16}$	2	2	8	4	6	4	$4\frac{5}{8}$	$\frac{19}{64}$
2	10	$\frac{7}{16}$	2	2	10	4	6	4	$4\frac{5}{8}$	$\frac{9}{32}$
2	10	$\frac{7}{16}$	2	3	0	4	6	4	$4\frac{5}{8}$	$\frac{17}{64}$
3	0	$\frac{7}{16}$	2	2	0	4	$9\frac{1}{8}$	4	$7\frac{3}{4}$	$\frac{13}{32}$
3	0	$\frac{7}{16}$	2	2	2	4	$9\frac{1}{8}$	4	$7\frac{3}{4}$	$\frac{3}{8}$
3	0	$\frac{7}{16}$	2	2	4	4	$9\frac{1}{8}$	4	$7\frac{3}{4}$	$\frac{11}{32}$
3	0	$\frac{7}{16}$	2	2	6	4	$9\frac{1}{8}$	4	$7\frac{3}{4}$	$\frac{21}{64}$
3	0	$\frac{7}{16}$	2	2	8	4	$9\frac{1}{8}$	4	$7\frac{3}{4}$	$\frac{5}{16}$
3	0	$\frac{7}{16}$	2	2	10	4	$9\frac{1}{8}$	4	$7\frac{3}{4}$	$\frac{19}{64}$

Inside diameter of Tube, Flue, or Boiler.		Thickness of Plate	Number of Plates in the Circle.	Breadth of Plate between centres of rivet holes.		Length of straight line between centres of rivet holes of Large end of Plate.		Length of straight line between centres of rivet holes of Small end of Plate.		Versed line.
FT.	IN.	Parts of an Inch.	No.	FT.	IN.	FT.	IN.	FT.	IN.	Parts of an Inch.
3	0	$\frac{7}{16}$	2	3	0	4	$9\frac{1}{8}$	4	$7\frac{3}{4}$	$\frac{9}{32}$
3	2	$\frac{7}{16}$	2	2	0	5	$0\frac{1}{4}$	4	$10\frac{7}{8}$	$\frac{27}{64}$
3	2	$\frac{7}{16}$	2	2	2	5	$0\frac{1}{4}$	4	$10\frac{7}{8}$	$\frac{13}{32}$
3	2	$\frac{7}{16}$	2	2	4	5	$0\frac{1}{4}$	4	$10\frac{7}{8}$	$\frac{3}{8}$
3	2	$\frac{7}{16}$	2	2	6	5	$0\frac{1}{4}$	4	$10\frac{7}{8}$	$\frac{11}{32}$
3	2	$\frac{7}{16}$	2	2	8	5	$0\frac{1}{4}$	4	$10\frac{7}{8}$	$\frac{21}{64}$
3	2	$\frac{7}{16}$	2	2	10	5	$0\frac{1}{4}$	4	$10\frac{7}{8}$	$\frac{5}{16}$
3	2	$\frac{7}{16}$	2	3	0	5	$0\frac{1}{4}$	4	$10\frac{7}{8}$	$\frac{19}{64}$
3	4	$\frac{7}{16}$	2	2	0	5	$3\frac{3}{8}$	5	2	$\frac{29}{64}$
3	4	$\frac{7}{16}$	2	2	2	5	$3\frac{3}{8}$	5	2	$\frac{27}{64}$
3	4	$\frac{7}{16}$	2	2	4	5	$3\frac{3}{8}$	5	2	$\frac{13}{32}$
3	4	$\frac{7}{16}$	2	2	6	5	$3\frac{3}{8}$	5	2	$\frac{3}{8}$
3	4	$\frac{7}{16}$	2	2	8	5	$3\frac{3}{8}$	5	2	$\frac{11}{64}$
3	4	$\frac{7}{16}$	2	2	10	5	$3\frac{3}{8}$	5	2	$\frac{5}{16}$
3	4	$\frac{7}{16}$	2	3	0	5	$3\frac{3}{8}$	5	2	$\frac{19}{64}$
3	6	$\frac{7}{16}$	2	2	0	5	$6\frac{1}{2}$	5	$5\frac{1}{8}$	$\frac{15}{32}$
3	6	$\frac{7}{16}$	2	2	2	5	$6\frac{1}{2}$	5	$5\frac{1}{8}$	$\frac{29}{64}$
3	6	$\frac{7}{16}$	2	2	4	5	$6\frac{1}{2}$	5	$5\frac{1}{8}$	$\frac{27}{64}$
3	6	$\frac{7}{16}$	2	2	6	5	$6\frac{1}{2}$	5	$5\frac{1}{8}$	$\frac{13}{32}$
3	6	$\frac{7}{16}$	2	2	8	5	$6\frac{1}{2}$	5	$5\frac{1}{8}$	$\frac{3}{8}$
3	6	$\frac{7}{16}$	2	2	10	5	$6\frac{1}{2}$	5	$5\frac{1}{8}$	$\frac{23}{64}$
3	6	$\frac{7}{16}$	2	3	0	5	$6\frac{1}{2}$	5	$5\frac{1}{8}$	$\frac{11}{64}$
3	8	$\frac{7}{16}$	2	2	0	5	$9\frac{5}{8}$	5	$8\frac{1}{4}$	$\frac{31}{64}$
3	8	$\frac{7}{16}$	2	2	·2	5	$9\frac{5}{8}$	5	$8\frac{1}{4}$	$\frac{15}{32}$
3	8	$\frac{7}{16}$	2	2	4	5	$9\frac{5}{8}$	5	$8\frac{1}{4}$	$\frac{7}{16}$
3	8	$\frac{7}{16}$	2	2	6	5	$9\frac{5}{8}$	5	$8\frac{1}{4}$	$\frac{27}{64}$
3	8	$\frac{7}{16}$	2	2	8	5	$9\frac{5}{8}$	5	$8\frac{1}{4}$	$\frac{13}{32}$
3	8	$\frac{7}{16}$	2	2	10	5	$9\frac{5}{8}$	5	$8\frac{1}{4}$	$\frac{3}{8}$
3	8	$\frac{7}{16}$	2	3	0	5	$9\frac{5}{8}$	5	$8\frac{1}{4}$	$\frac{11}{32}$
3	10	$\frac{7}{16}$	2	2	0	6	$0\frac{3}{4}$	5	$11\frac{3}{8}$	$\frac{33}{64}$

TEMPLATE MAKING.

Inside diameter of Tube, Flue, or Boiler.		Thickness of Plate	Number of Plates in the Circle.	Breadth of Plate between centres of rivet holes.		Length of straight line between centres of rivet holes of Large end of Plate.		Length of straight line between centres of rivet holes of Small end of Plate.		Versed line.
FT.	IN.	Parts of an Inch.	No.	FT.	IN.	FT.	IN.	FT.	IN.	Parts of an Inch.
3	10	$\frac{7}{16}$	2	2	2	6	$0\frac{3}{4}$	5	$11\frac{3}{8}$	$\frac{31}{64}$
3	10	$\frac{7}{16}$	2	2	4	6	$0\frac{3}{4}$	5	$11\frac{3}{8}$	$\frac{15}{32}$
3	10	$\frac{7}{16}$	2	2	6	6	$0\frac{3}{4}$	5	$11\frac{3}{8}$	$\frac{7}{16}$
3	10	$\frac{7}{16}$	2	2	8	6	$0\frac{3}{4}$	5	$11\frac{3}{8}$	$\frac{27}{64}$
3	10	$\frac{7}{16}$	2	2	10	6	$0\frac{3}{4}$	5	$11\frac{3}{8}$	$\frac{25}{64}$
3	10	$\frac{7}{16}$	2	3	0	6	$0\frac{3}{4}$	5	$11\frac{3}{8}$	$\frac{3}{8}$
4	0	$\frac{7}{16}$	2	2	0	7	$3\frac{7}{8}$	7	$2\frac{1}{2}$	$\frac{17}{32}$
4	0	$\frac{7}{16}$	2	2	2	7	$3\frac{7}{8}$	7	$2\frac{1}{2}$	$\frac{1}{2}$
4	0	$\frac{7}{16}$	2	2	4	7	$3\frac{7}{8}$	7	$2\frac{1}{2}$	$\frac{15}{32}$
4	0	$\frac{7}{16}$	2	2	6	7	$3\frac{7}{8}$	7	$2\frac{1}{2}$	$\frac{29}{64}$
4	0	$\frac{7}{16}$	2	2	8	7	$3\frac{7}{8}$	7	$2\frac{1}{2}$	$\frac{7}{16}$
4	0	$\frac{7}{16}$	2	2	10	7	$3\frac{7}{8}$	7	$2\frac{1}{2}$	$\frac{25}{64}$
4	0	$\frac{7}{16}$	2	3	0	7	$3\frac{7}{8}$	7	$2\frac{1}{2}$	$\frac{3}{8}$
3	0	$\frac{7}{16}$	3	2	0	3	$2\frac{1}{8}$	3	$1\frac{1}{8}$	$\frac{11}{64}$
3	0	$\frac{7}{16}$	3	2	2	3	$2\frac{1}{8}$	3	$1\frac{1}{8}$	$\frac{5}{32}$
3	0	$\frac{7}{16}$	3	2	4	3	$2\frac{1}{8}$	3	$1\frac{1}{8}$	$\frac{5}{32}$
3	0	$\frac{7}{16}$	3	2	6	3	$2\frac{1}{8}$	3	$1\frac{1}{8}$	$\frac{9}{64}$
3	0	$\frac{7}{16}$	3	2	8	3	$2\frac{1}{8}$	3	$1\frac{1}{8}$	$\frac{9}{64}$
3	0	$\frac{7}{16}$	3	2	10	3	$2\frac{1}{8}$	3	$1\frac{1}{8}$	$\frac{1}{8}$
3	0	$\frac{7}{16}$	3	3	0	3	$2\frac{1}{8}$	3	$1\frac{1}{8}$	$\frac{1}{8}$
3	2	$\frac{7}{16}$	3	2	0	3	$4\frac{1}{8}$	3	$3\frac{1}{8}$	$\frac{3}{16}$
3	2	$\frac{7}{16}$	3	2	2	3	$4\frac{1}{8}$	3	$3\frac{1}{8}$	$\frac{3}{16}$
3	2	$\frac{7}{16}$	3	2	4	3	$4\frac{1}{8}$	3	$3\frac{1}{8}$	$\frac{11}{64}$
3	2	$\frac{7}{16}$	3	2	6	3	$4\frac{1}{8}$	3	$3\frac{1}{8}$	$\frac{5}{32}$
3	2	$\frac{7}{16}$	3	2	8	3	$4\frac{1}{8}$	3	$3\frac{1}{8}$	$\frac{5}{32}$
3	2	$\frac{7}{16}$	3	2	10	3	$4\frac{1}{8}$	3	$3\frac{1}{8}$	$\frac{9}{64}$
3	2	$\frac{7}{16}$	3	3	0	3	$4\frac{1}{8}$	3	$3\frac{1}{8}$	$\frac{1}{8}$
3	4	$\frac{7}{16}$	3	2	0	3	$6\frac{1}{4}$	3	$5\frac{3}{8}$	$\frac{13}{64}$
3	4	$\frac{7}{16}$	3	2	2	3	$6\frac{1}{4}$	3	$5\frac{3}{8}$	$\frac{3}{16}$
3	4	$\frac{7}{16}$	3	2	4	3	$6\frac{1}{4}$	3	$5\frac{3}{8}$	$\frac{11}{64}$

Inside diameter of Tube, Flue, or Boiler.		Thickness of Plate	Number of Plates in the Circle.	Breadth of Plate between centres of rivet holes.		Length of straight line between centres of rivet holes of Large end of Plate.		Length of straight line between centres of rivet holes of Small end of Plate.		Versed line.
FT.	IN.	Parts of an Inch.	No.	FT.	IN.	FT.	IN.	FT.	IN.	Parts of an Inch.
3	4	$\frac{7}{16}$	3	2	6	3	$6\frac{1}{4}$	3	$5\frac{3}{8}$	$\frac{11}{64}$
3	4	$\frac{7}{16}$	3	2	8	3	$6\frac{1}{4}$	3	$5\frac{3}{8}$	$\frac{5}{32}$
3	4	$\frac{7}{16}$	3	2	10	3	$6\frac{1}{4}$	3	$5\frac{3}{8}$	$\frac{5}{32}$
3	4	$\frac{7}{16}$	3	3	0	3	$6\frac{1}{4}$	3	$5\frac{3}{8}$	$\frac{9}{64}$
3	6	$\frac{7}{16}$	3	2	0	3	$8\frac{3}{8}$	3	$7\frac{1}{2}$	$\frac{13}{64}$
3	6	$\frac{7}{16}$	3	2	2	3	$8\frac{3}{8}$	3	$7\frac{1}{2}$	$\frac{3}{16}$
3	6	$\frac{7}{16}$	3	2	4	3	$8\frac{3}{8}$	3	$7\frac{1}{2}$	$\frac{11}{64}$
3	6	$\frac{7}{16}$	3	2	6	3	$8\frac{3}{8}$	3	$7\frac{1}{2}$	$\frac{11}{64}$
3	6	$\frac{7}{16}$	3	2	8	3	$8\frac{3}{8}$	3	$7\frac{1}{2}$	$\frac{5}{32}$
3	6	$\frac{7}{16}$	3	2	10	3	$8\frac{3}{8}$	3	$7\frac{1}{2}$	$\frac{5}{32}$
3	6	$\frac{7}{16}$	3	3	0	3	$8\frac{3}{8}$	3	$7\frac{1}{2}$	$\frac{9}{64}$
3	8	$\frac{7}{16}$	3	2	0	3	$10\frac{1}{2}$	3	$9\frac{1}{2}$	$\frac{7}{32}$
3	8	$\frac{7}{16}$	3	2	2	3	$10\frac{1}{2}$	3	$9\frac{1}{2}$	$\frac{13}{64}$
3	8	$\frac{7}{16}$	3	2	4	3	$10\frac{1}{2}$	3	$9\frac{1}{2}$	$\frac{13}{64}$
3	8	$\frac{7}{16}$	3	2	6	3	$10\frac{1}{2}$	3	$9\frac{1}{2}$	$\frac{3}{16}$
3	8	$\frac{7}{16}$	3	2	8	3	$10\frac{1}{2}$	3	$9\frac{1}{2}$	$\frac{11}{64}$
3	8	$\frac{7}{16}$	3	2	10	3	$10\frac{1}{2}$	3	$9\frac{1}{2}$	$\frac{11}{64}$
3	8	$\frac{7}{16}$	3	3	0	3	$10\frac{1}{2}$	3	$9\frac{1}{2}$	$\frac{5}{32}$
3	10	$\frac{7}{16}$	3	2	0	4	$0\frac{1}{2}$	3	$11\frac{5}{8}$	$\frac{15}{64}$
3	10	$\frac{7}{16}$	3	2	2	4	$0\frac{1}{2}$	3	$11\frac{5}{8}$	$\frac{7}{32}$
3	10	$\frac{7}{16}$	3	2	4	4	$0\frac{1}{2}$	3	$11\frac{5}{8}$	$\frac{13}{64}$
3	10	$\frac{7}{16}$	3	2	6	4	$0\frac{1}{2}$	3	$11\frac{5}{8}$	$\frac{13}{64}$
3	10	$\frac{7}{16}$	3	2	8	4	$0\frac{1}{2}$	3	$11\frac{5}{8}$	$\frac{3}{16}$
3	10	$\frac{7}{16}$	3	2	10	4	$0\frac{1}{2}$	3	$11\frac{5}{8}$	$\frac{11}{64}$
3	10	$\frac{7}{16}$	3	3	0	4	$0\frac{1}{2}$	3	$11\frac{5}{8}$	$\frac{11}{64}$
4	0	$\frac{7}{16}$	3	2	0	4	$2\frac{5}{8}$	4	$1\frac{3}{4}$	$\frac{15}{64}$
4	0	$\frac{7}{16}$	3	2	2	4	$2\frac{5}{8}$	4	$1\frac{3}{4}$	$\frac{15}{64}$
4	0	$\frac{7}{16}$	3	2	4	4	$2\frac{5}{8}$	4	$1\frac{3}{4}$	$\frac{7}{32}$
4	0	$\frac{7}{16}$	3	2	6	4	$2\frac{5}{8}$	4	$1\frac{3}{4}$	$\frac{13}{64}$
4	0	$\frac{7}{16}$	3	2	8	4	$2\frac{5}{8}$	4	$1\frac{3}{4}$	$\frac{13}{64}$

TEMPLATE MAKING.

Inside diameter of Tube, Flue, or Boiler.		Thickness of Plate	Number of Plates in the Circle.	Breadth of Plate between centres of rivet holes.		Length of straight line between centres of rivet holes of Large end of Plate.		Length of straight line between centres of rivet holes of Small end of Plate.		Versed line.
FT.	IN.	Parts of an Inch.	No.	FT.	IN.	FT.	IN.	FT.	IN.	Parts of an Inch.
4	0	$\frac{7}{16}$	3	2	10	4	$2\frac{5}{8}$	4	$1\frac{3}{4}$	$\frac{3}{16}$
4	0	$\frac{7}{16}$	3	3	0	4	$2\frac{5}{8}$	4	$1\frac{3}{4}$	$\frac{11}{64}$
4	2	$\frac{7}{16}$	3	2	0	4	$4\frac{3}{4}$	4	$3\frac{7}{8}$	$\frac{1}{4}$
4	2	$\frac{7}{16}$	3	2	2	4	$4\frac{3}{4}$	4	$3\frac{7}{8}$	$\frac{15}{64}$
4	2	$\frac{7}{16}$	3	2	4	4	$4\frac{3}{4}$	4	$3\frac{7}{8}$	$\frac{7}{32}$
4	2	$\frac{7}{16}$	3	2	6	4	$4\frac{3}{4}$	4	$3\frac{7}{8}$	$\frac{13}{64}$
4	2	$\frac{7}{16}$	3	2	8	4	$4\frac{3}{4}$	4	$3\frac{7}{8}$	$\frac{3}{16}$
4	2	$\frac{7}{16}$	3	2	10	4	$4\frac{3}{4}$	4	$3\frac{7}{8}$	$\frac{11}{64}$
4	2	$\frac{7}{16}$	3	3	0	4	$4\frac{3}{4}$	4	$3\frac{7}{8}$	$\frac{11}{64}$
4	4	$\frac{7}{16}$	3	2	0	4	$6\frac{7}{8}$	4	$5\frac{7}{8}$	$\frac{1}{4}$
4	4	$\frac{7}{16}$	3	2	2	4	$6\frac{7}{8}$	4	$5\frac{7}{8}$	$\frac{15}{64}$
4	4	$\frac{7}{16}$	3	2	4	4	$6\frac{7}{8}$	4	$5\frac{7}{8}$	$\frac{7}{32}$
4	4	$\frac{7}{16}$	3	2	6	4	$6\frac{7}{8}$	4	$5\frac{7}{8}$	$\frac{13}{64}$
4	4	$\frac{7}{16}$	3	2	8	4	$6\frac{7}{8}$	4	$5\frac{7}{8}$	$\frac{13}{64}$
4	4	$\frac{7}{16}$	3	2	10	4	$6\frac{7}{8}$	4	$5\frac{7}{8}$	$\frac{3}{16}$
4	4	$\frac{7}{16}$	3	3	0	4	$6\frac{7}{8}$	4	$5\frac{7}{8}$	$\frac{11}{64}$
4	6	$\frac{7}{16}$	3	2	0	4	9	4	8	$\frac{17}{64}$
4	6	$\frac{7}{16}$	3	2	2	4	9	4	8	$\frac{1}{4}$
4	6	$\frac{7}{16}$	3	2	4	4	9	4	8	$\frac{15}{64}$
4	6	$\frac{7}{16}$	3	2	6	4	9	4	8	$\frac{13}{64}$
4	6	$\frac{7}{16}$	3	2	8	4	9	4	8	$\frac{13}{64}$
4	6	$\frac{7}{16}$	3	2	10	4	9	4	8	$\frac{3}{16}$
4	6	$\frac{7}{16}$	3	3	0	4	9	4	8	$\frac{11}{64}$
4	8	$\frac{7}{16}$	3	2	0	4	11	4	10	$\frac{9}{32}$
4	8	$\frac{7}{16}$	3	2	2	4	11	4	10	$\frac{17}{64}$
4	8	$\frac{7}{16}$	3	2	4	4	11	4	10	$\frac{1}{4}$
4	8	$\frac{7}{16}$	3	2	6	4	11	4	10	$\frac{15}{64}$
4	8	$\frac{7}{16}$	3	2	8	4	11	4	10	$\frac{7}{32}$
4	8	$\frac{7}{16}$	3	2	10	4	11	4	10	$\frac{13}{64}$
4	8	$\frac{7}{16}$	3	3	0	4	11	4	10	$\frac{3}{16}$

Inside diameter of Tube, Flue, or Boiler.		Thickness of Plate	Number of Plates in the Circle.	Breadth of Plate between centres of rivet holes.		Length of straight line between centres of rivet holes of Large end of Plate.		Length of straight line between centres of rivet holes of Small end of Plate.		Versed line.
FT.	IN.	Parts of an Inch.	No.	FT.	IN.	FT.	IN.	FT.	IN.	Parts of an Inch.
4	10	$\frac{7}{16}$	3	2	0	5	$1\frac{1}{8}$	5	$0\frac{1}{4}$	$\frac{9}{32}$
4	10	$\frac{7}{16}$	3	2	2	5	$1\frac{1}{8}$	5	$0\frac{1}{4}$	$\frac{17}{64}$
4	10	$\frac{7}{16}$	3	2	4	5	$1\frac{1}{8}$	5	$0\frac{1}{4}$	$\frac{1}{4}$
4	10	$\frac{7}{16}$	3	2	6	5	$1\frac{1}{8}$	5	$0\frac{1}{4}$	$\frac{15}{64}$
4	10	$\frac{7}{16}$	3	2	8	5	$1\frac{1}{8}$	5	$0\frac{1}{4}$	$\frac{7}{32}$
4	10	$\frac{7}{16}$	3	2	10	5	$1\frac{1}{8}$	5	$0\frac{1}{4}$	$\frac{13}{64}$
4	10	$\frac{7}{16}$	3	3	0	5	$1\frac{1}{8}$	5	$0\frac{1}{4}$	$\frac{1}{4}$
5	0	$\frac{7}{16}$	3	2	0	5	$3\frac{1}{8}$	5	$2\frac{1}{4}$	$\frac{9}{64}$
5	0	$\frac{7}{16}$	3	2	2	5	$3\frac{1}{8}$	5	$2\frac{1}{4}$	$\frac{9}{32}$
5	0	$\frac{7}{16}$	3	2	4	5	$3\frac{1}{8}$	5	$2\frac{1}{4}$	$\frac{17}{64}$
5	0	$\frac{7}{16}$	3	2	6	5	$3\frac{1}{8}$	5	$2\frac{1}{4}$	$\frac{1}{4}$
5	0	$\frac{7}{16}$	3	2	8	5	$3\frac{1}{8}$	5	$2\frac{1}{4}$	$\frac{15}{64}$
5	0	$\frac{7}{16}$	3	2	10	5	$3\frac{1}{8}$	5	$2\frac{1}{4}$	$\frac{7}{32}$
5	0	$\frac{7}{16}$	3	3	0	5	$3\frac{1}{8}$	5	$2\frac{1}{4}$	$\frac{13}{64}$
5	2	$\frac{7}{16}$	3	2	0	5	$5\frac{3}{8}$	5	$4\frac{3}{8}$	$\frac{5}{16}$
5	2	$\frac{7}{16}$	3	2	2	5	$5\frac{3}{8}$	5	$4\frac{3}{8}$	$\frac{19}{64}$
5	2	$\frac{7}{16}$	3	2	4	5	$5\frac{3}{8}$	5	$4\frac{3}{8}$	$\frac{9}{32}$
5	2	$\frac{7}{16}$	3	2	6	5	$5\frac{3}{8}$	5	$4\frac{3}{8}$	$\frac{1}{4}$
5	2	$\frac{7}{16}$	3	2	8	5	$5\frac{3}{8}$	5	$4\frac{3}{8}$	$\frac{15}{64}$
5	2	$\frac{7}{16}$	3	2	10	5	$5\frac{3}{8}$	5	$4\frac{3}{8}$	$\frac{7}{32}$
5	2	$\frac{7}{16}$	3	3	0	5	$5\frac{3}{8}$	5	$4\frac{3}{8}$	$\frac{13}{64}$
5	4	$\frac{7}{16}$	3	2	0	5	$7\frac{3}{8}$	5	$6\frac{1}{2}$	$\frac{5}{16}$
5	4	$\frac{7}{16}$	3	2	2	5	$7\frac{3}{8}$	5	$6\frac{1}{2}$	$\frac{19}{64}$
5	4	$\frac{7}{16}$	3	2	4	5	$7\frac{3}{8}$	5	$6\frac{1}{2}$	$\frac{9}{32}$
5	4	$\frac{7}{16}$	3	2	6	5	$7\frac{3}{8}$	5	$6\frac{1}{2}$	$\frac{17}{64}$
5	4	$\frac{7}{16}$	3	2	8	5	$7\frac{3}{8}$	5	$6\frac{1}{2}$	$\frac{15}{64}$
5	4	$\frac{7}{16}$	3	2	10	5	$7\frac{3}{8}$	5	$6\frac{1}{2}$	$\frac{15}{64}$
5	4	$\frac{7}{16}$	3	3	0	5	$7\frac{3}{8}$	5	$6\frac{1}{2}$	$\frac{7}{32}$
5	6	$\frac{7}{16}$	3	2	0	5	$9\frac{1}{2}$	5	$8\frac{5}{8}$	$\frac{21}{64}$
5	6	$\frac{7}{16}$	3	2	2	5	$9\frac{1}{2}$	5	$8\frac{5}{8}$	$\frac{5}{16}$

Inside diameter of Tube, Flue, or Boiler.		Thickness of Plate	Number of Plates in the Circle.	Breadth of Plate between centres of rivet holes.		Length of straight line between centres of rivet holes of Large end of Plate.		Length of straight line between centres of rivet holes of Small end of Plate.		Versed line.
FT.	IN.	Parts of an Inch.	No.	FT.	IN.	FT.	IN.	FT.	IN.	Parts of an Inch.
5	6	$\frac{7}{16}$	3	2	4	5	$9\frac{1}{2}$	5	$8\frac{5}{8}$	$\frac{9}{32}$
5	6	$\frac{7}{16}$	3	2	6	5	$9\frac{1}{2}$	5	$8\frac{5}{8}$	$\frac{17}{64}$
5	6	$\frac{7}{16}$	3	2	8	5	$9\frac{1}{2}$	5	$8\frac{5}{8}$	$\frac{1}{4}$
5	6	$\frac{7}{16}$	3	2	10	5	$9\frac{1}{2}$	5	$8\frac{5}{8}$	$\frac{15}{64}$
5	6	$\frac{7}{16}$	3	3	0	5	$9\frac{1}{2}$	5	$8\frac{5}{8}$	$\frac{7}{32}$
5	8	$\frac{7}{16}$	3	2	0	5	$11\frac{5}{8}$	5	$10\frac{3}{4}$	$\frac{21}{64}$
5	8	$\frac{7}{16}$	3	2	2	5	$11\frac{5}{8}$	5	$10\frac{3}{4}$	$\frac{5}{16}$
5	8	$\frac{7}{16}$	3	2	4	5	$11\frac{5}{8}$	5	$10\frac{3}{4}$	$\frac{19}{64}$
5	8	$\frac{7}{16}$	3	2	6	5	$11\frac{5}{8}$	5	$10\frac{3}{4}$	$\frac{9}{32}$
5	8	$\frac{7}{16}$	3	2	8	5	$11\frac{5}{8}$	5	$10\frac{3}{4}$	$\frac{1}{4}$
5	8	$\frac{7}{16}$	3	2	10	5	$11\frac{5}{8}$	5	$10\frac{3}{4}$	$\frac{1}{4}$
5	8	$\frac{7}{16}$	3	3	0	5	$11\frac{5}{8}$	5	$10\frac{3}{4}$	$\frac{15}{64}$
5	10	$\frac{7}{16}$	3	2	0	6	$1\frac{3}{4}$	6	$0\frac{3}{4}$	$\frac{11}{32}$
5	10	$\frac{7}{16}$	3	2	2	6	$1\frac{3}{4}$	6	$0\frac{3}{4}$	$\frac{21}{64}$
5	10	$\frac{7}{16}$	3	2	4	6	$1\frac{3}{4}$	6	$0\frac{3}{4}$	$\frac{5}{16}$
5	10	$\frac{7}{16}$	3	2	6	6	$1\frac{3}{4}$	6	$0\frac{3}{4}$	$\frac{9}{32}$
5	10	$\frac{7}{16}$	3	2	8	6	$1\frac{3}{4}$	6	$0\frac{3}{4}$	$\frac{17}{64}$
5	10	$\frac{7}{16}$	3	2	10	6	$1\frac{3}{4}$	6	$0\frac{3}{4}$	$\frac{1}{4}$
5	10	$\frac{7}{16}$	3	3	0	6	$1\frac{3}{4}$	6	$0\frac{3}{4}$	$\frac{15}{64}$
6	0	$\frac{7}{16}$	3	2	0	6	$3\frac{3}{4}$	6	$2\frac{7}{8}$	$\frac{23}{64}$
6	0	$\frac{7}{16}$	3	2	2	6	$3\frac{3}{4}$	6	$2\frac{7}{8}$	$\frac{21}{64}$
6	0	$\frac{7}{16}$	3	2	4	6	$3\frac{3}{4}$	6	$2\frac{7}{8}$	$\frac{5}{16}$
6	0	$\frac{7}{16}$	3	2	6	6	$3\frac{3}{4}$	6	$2\frac{7}{8}$	$\frac{19}{64}$
6	0	$\frac{7}{16}$	3	2	8	6	$3\frac{3}{4}$	6	$2\frac{7}{8}$	$\frac{9}{32}$
6	0	$\frac{7}{16}$	3	2	10	6	$3\frac{3}{4}$	6	$2\frac{7}{8}$	$\frac{1}{4}$
6	0	$\frac{7}{16}$	3	3	0	6	$3\frac{3}{4}$	6	$2\frac{7}{8}$	$\frac{15}{64}$
6	2	$\frac{7}{16}$	3	2	0	6	$5\frac{7}{8}$	6	5	$\frac{23}{64}$
6	2	$\frac{7}{16}$	3	2	2	6	$5\frac{7}{8}$	6	5	$\frac{11}{32}$
6	2	$\frac{7}{16}$	3	2	4	6	$5\frac{7}{8}$	6	5	$\frac{21}{64}$
6	2	$\frac{7}{16}$	3	2	6	6	$5\frac{7}{8}$	6	5	$\frac{5}{16}$

Inside diameter of Tube, Flue, or Boiler.		Thickness of Plate	Number of Plates in the Circle.	Breadth of Plate between centres of rivet holes.		Length of straight line between centres of rivet holes of Large end of Plate.		Length of straight line between centres of rivet holes of Small end of Plate.		Versed line.
FT.	IN.	Parts of an Inch.	No.	FT.	IN.	FT.	IN.	FT.	IN.	Parts of an Inch.
6	2	$\frac{7}{16}$	3	2	8	6	$5\frac{7}{8}$	6	5	$\frac{9}{32}$
6	2	$\frac{7}{16}$	3	2	10	6	$5\frac{7}{8}$	6	5	$\frac{17}{64}$
6	2	$\frac{7}{16}$	3	3	0	6	$5\frac{7}{8}$	6	5	$\frac{1}{4}$
5	6	$\frac{1}{2}$	3	2	4	5	$9\frac{1}{2}$	5	$8\frac{1}{2}$	$\frac{21}{64}$
5	6	$\frac{1}{2}$	3	2	6	5	$9\frac{1}{2}$	5	$8\frac{1}{2}$	$\frac{5}{16}$
5	6	$\frac{1}{2}$	3	2	8	5	$9\frac{1}{2}$	5	$8\frac{1}{2}$	$\frac{9}{32}$
5	6	$\frac{1}{2}$	3	2	10	5	$9\frac{1}{2}$	5	$8\frac{1}{2}$	$\frac{1}{4}$
5	6	$\frac{1}{2}$	3	3	0	5	$9\frac{1}{2}$	5	$8\frac{1}{2}$	$\frac{15}{64}$
5	8	$\frac{1}{2}$	3	2	4	5	$11\frac{5}{8}$	5	$10\frac{1}{2}$	$\frac{21}{64}$
5	8	$\frac{1}{2}$	3	2	6	5	$11\frac{5}{8}$	5	$10\frac{1}{2}$	$\frac{5}{16}$
5	8	$\frac{1}{2}$	3	2	8	5	$11\frac{5}{8}$	5	$10\frac{1}{2}$	$\frac{19}{64}$
5	8	$\frac{1}{2}$	3	2	10	5	$11\frac{5}{8}$	5	$10\frac{1}{2}$	$\frac{9}{32}$
5	8	$\frac{1}{2}$	3	3	0	5	$11\frac{5}{8}$	5	$10\frac{1}{2}$	$\frac{1}{4}$
5	10	$\frac{1}{2}$	3	2	4	6	$1\frac{5}{8}$	6	$0\frac{5}{8}$	$\frac{13}{32}$
5	10	$\frac{1}{2}$	3	2	6	6	$1\frac{5}{8}$	6	$0\frac{5}{8}$	$\frac{21}{64}$
5	10	$\frac{1}{2}$	3	2	8	6	$1\frac{5}{8}$	6	$0\frac{5}{8}$	$\frac{5}{16}$
5	10	$\frac{1}{2}$	3	2	10	6	$1\frac{5}{8}$	6	$0\frac{5}{8}$	$\frac{9}{32}$
5	10	$\frac{1}{2}$	3	3	0	6	$1\frac{5}{8}$	6	$0\frac{5}{8}$	$\frac{17}{64}$
6	0	$\frac{1}{2}$	3	2	4	6	$3\frac{3}{4}$	6	$2\frac{3}{4}$	$\frac{23}{64}$
6	0	$\frac{1}{2}$	3	2	6	6	$3\frac{3}{4}$	6	$2\frac{3}{4}$	$\frac{21}{64}$
6	0	$\frac{1}{2}$	3	2	8	6	$3\frac{3}{4}$	6	$2\frac{3}{4}$	$\frac{5}{16}$
6	0	$\frac{1}{2}$	3	2	10	6	$3\frac{3}{4}$	6	$2\frac{3}{4}$	$\frac{19}{64}$
6	0	$\frac{1}{2}$	3	3	0	6	$3\frac{3}{4}$	6	$2\frac{3}{4}$	$\frac{9}{32}$
6	2	$\frac{1}{2}$	3	2	4	6	$5\frac{7}{8}$	6	$4\frac{7}{8}$	$\frac{23}{64}$
6	2	$\frac{1}{2}$	3	2	6	6	$5\frac{7}{8}$	6	$4\frac{7}{8}$	$\frac{21}{64}$
6	2	$\frac{1}{2}$	3	2	8	6	$5\frac{7}{8}$	6	$4\frac{7}{8}$	$\frac{5}{16}$
6	2	$\frac{1}{2}$	3	2	10	6	$5\frac{7}{8}$	6	$4\frac{7}{8}$	$\frac{19}{64}$
6	2	$\frac{1}{2}$	3	3	0	6	$5\frac{7}{8}$	6	$4\frac{7}{8}$	$\frac{9}{32}$
6	4	$\frac{1}{2}$	3	2	4	6	$7\frac{7}{8}$	6	$6\frac{7}{8}$	$\frac{3}{8}$
6	4	$\frac{1}{2}$	3	2	6	6	$7\frac{7}{8}$	6	$6\frac{7}{8}$	$\frac{23}{64}$

Inside diameter of Tube, Flue, or Boiler.		Thickness of Plate	Number of Plates in the Circle.	Breadth of Plate between centres of rivet holes.		Length of straight line between centres of rivet holes of Large end of Plate.		Length of straight line between centres of rivet holes of Small end of Plate.		Versed line.
FT.	IN.	Parts of an Inch.	No.	FT.	IN.	FT.	IN.	FT.	IN.	Parts of an Inch.
6	4	$\frac{1}{2}$	3	2	8	6	$7\frac{7}{8}$	6	$6\frac{7}{8}$	$\frac{21}{64}$
6	4	$\frac{1}{2}$	3	2	10	6	$7\frac{7}{8}$	6	$6\frac{7}{8}$	$\frac{5}{16}$
6	4	$\frac{1}{2}$	3	3	0	6	$7\frac{7}{8}$	6	$6\frac{7}{8}$	$\frac{9}{32}$
6	6	$\frac{1}{2}$	3	2	4	6	10	6	9	$\frac{3}{8}$
6	6	$\frac{1}{2}$	3	2	6	6	10	6	9	$\frac{23}{64}$
6	6	$\frac{1}{2}$	3	2	8	6	10	6	9	$\frac{11}{32}$
6	6	$\frac{1}{2}$	3	2	10	6	10	6	9	$\frac{21}{64}$
6	6	$\frac{1}{2}$	3	3	0	6	10	6	9	$\frac{19}{64}$
6	8	$\frac{1}{2}$	3	2	4	7	$0\frac{1}{8}$	6	$11\frac{1}{8}$	$\frac{25}{64}$
6	8	$\frac{1}{2}$	3	2	6	7	$0\frac{1}{8}$	6	$11\frac{1}{8}$	$\frac{23}{64}$
6	8	$\frac{1}{2}$	3	2	8	7	$0\frac{1}{8}$	6	$11\frac{1}{8}$	$\frac{21}{64}$
6	8	$\frac{1}{2}$	3	2	10	7	$0\frac{1}{8}$	6	$11\frac{1}{8}$	$\frac{5}{16}$
6	8	$\frac{1}{2}$	3	3	0	7	$0\frac{1}{8}$	6	$11\frac{1}{8}$	$\frac{19}{64}$
6	10	$\frac{1}{2}$	3	2	4	7	$2\frac{1}{4}$	7	$1\frac{1}{8}$	$\frac{25}{64}$
6	10	$\frac{1}{2}$	3	2	6	7	$2\frac{1}{4}$	7	$1\frac{1}{8}$	$\frac{3}{8}$
6	10	$\frac{1}{2}$	3	2	8	7	$2\frac{1}{4}$	7	$1\frac{1}{8}$	$\frac{23}{64}$
6	10	$\frac{1}{2}$	3	2	10	7	$2\frac{1}{4}$	7	$1\frac{1}{8}$	$\frac{21}{64}$
6	10	$\frac{1}{2}$	3	3	0	7	$2\frac{1}{4}$	7	$1\frac{1}{8}$	$\frac{5}{16}$
7	0	$\frac{1}{2}$	3	2	4	7	$4\frac{3}{8}$	7	$3\frac{1}{4}$	$\frac{13}{32}$
7	0	$\frac{1}{2}$	3	2	6	7	$4\frac{3}{8}$	7	$3\frac{1}{4}$	$\frac{3}{8}$
7	0	$\frac{1}{2}$	3	2	8	7	$4\frac{3}{8}$	7	$3\frac{1}{4}$	$\frac{23}{64}$
7	0	$\frac{1}{2}$	3	2	10	7	$4\frac{3}{8}$	7	$3\frac{1}{4}$	$\frac{11}{32}$
7	0	$\frac{1}{2}$	3	3	0	7	$4\frac{3}{8}$	7	$3\frac{1}{4}$	$\frac{5}{16}$
6	0	$\frac{1}{2}$	4	2	4	4	$8\frac{7}{8}$	4	8	$\frac{3}{16}$
6	0	$\frac{1}{2}$	4	2	6	4	$8\frac{7}{8}$	4	8	$\frac{11}{64}$
6	0	$\frac{1}{2}$	4	2	8	4	$8\frac{7}{8}$	4	8	$\frac{11}{64}$
6	0	$\frac{1}{2}$	4	2	10	4	$8\frac{7}{8}$	4	8	$\frac{5}{32}$
6	0	$\frac{1}{2}$	4	3	0	4	$8\frac{7}{8}$	4	8	$\frac{5}{32}$
6	2	$\frac{1}{2}$	4	2	4	4	$10\frac{1}{2}$	4	$9\frac{5}{8}$	$\frac{13}{64}$
6	2	$\frac{1}{2}$	4	2	6	4	$10\frac{1}{2}$	4	$9\frac{5}{8}$	$\frac{3}{16}$

Inside diameter of Tube, Flue, or Boiler.		Thickness of Plate	Number of Plates in the Circle.	Breadth of Plate between centres of rivet holes.		Length of straight line between centres of rivet holes of Large end of Plate.		Length of straight line between centres of rivet holes of Small end of Plate.		Versed line.
FT.	IN.	Parts of an Inch.	No.	FT.	IN.	FT.	IN.	FT.	IN.	Parts of an Inch.
6	2	½	4	2	8	4	10½	4	9⅝	11/64
6	2	½	4	2	10	4	10½	4	9⅝	11/64
6	2	½	4	3	0	4	10½	4	9⅝	5/32
6	4	½	4	2	4	5	0	4	11⅛	13/64
6	4	½	4	2	6	5	0	4	11⅛	3/16
6	4	½	4	2	8	5	0	4	11⅛	11/64
6	4	½	4	2	10	5	0	4	11⅛	11/64
6	4	½	4	3	0	5	0	4	11⅛	5/32
6	6	½	4	2	4	5	1⅝	5	0¾	13/64
6	6	½	4	2	6	5	1⅝	5	0¾	3/16
6	6	½	4	2	8	5	1⅝	5	0¾	3/16
6	6	½	4	2	10	5	1⅝	5	0¾	11/64
6	6	½	4	3	0	5	1⅝	5	0¾	5/32
6	8	½	4	2	4	5	3⅛	5	2¼	7/32
6	8	½	4	2	6	5	3⅛	5	2¼	13/64
6	8	½	4	2	8	5	3⅛	5	2¼	3/16
6	8	½	4	2	10	5	3⅛	5	2¼	3/16
6	8	½	4	3	0	5	3⅛	5	2¼	11/64
6	10	½	4	2	4	5	4¾	5	4	7/32
6	10	½	4	2	6	5	4¾	5	4	13/64
6	10	½	4	2	8	5	4¾	5	4	3/16
6	10	½	4	2	10	5	4¾	5	4	3/16
6	10	½	4	3	0	5	4¾	5	4	11/64
7	0	½	4	2	4	5	6¼	5	5½	7/32
7	0	½	4	2	6	5	6¼	5	5½	7/32
7	0	½	4	2	8	5	6¼	5	5½	13/64
7	0	½	4	2	10	5	6¼	5	5½	3/16
7	0	½	4	3	0	5	6¼	5	5½	11/64
7	2	½	4	2	4	5	7⅞	5	7	15/64
7	2	½	4	2	6	5	7⅞	5	7	7/32

Inside diameter of Tube, Flue, or Boiler.		Thickness of Plate	Number of Plates in the Circle.	Breadth of Plate between centres of rivet holes.		Length of straight line between centres of rivet holes of Large end of Plate.		Length of straight line between centres of rivet holes of Small end of Plate.		Versed line.
FT.	IN.	Parts of an Inch.	No.	FT.	IN.	FT.	IN.	FT.	IN.	Parts of an Inch.
7	2	$\frac{1}{2}$	4	2	8	5	$7\frac{7}{8}$	5	7	$\frac{13}{64}$
7	2	$\frac{1}{2}$	4	2	10	5	$7\frac{7}{8}$	5	7	$\frac{3}{16}$
7	2	$\frac{1}{2}$	4	3	0	5	$7\frac{7}{8}$	5	7	$\frac{11}{64}$
7	4	$\frac{1}{2}$	4	2	4	5	$9\frac{3}{8}$	5	$8\frac{1}{2}$	$\frac{15}{16}$
7	4	$\frac{1}{2}$	4	2	6	5	$9\frac{3}{8}$	5	$8\frac{1}{2}$	$\frac{7}{32}$
7	4	$\frac{1}{2}$	4	2	8	5	$9\frac{3}{8}$	5	$8\frac{1}{2}$	$\frac{7}{32}$
7	4	$\frac{1}{2}$	4	2	10	5	$9\frac{3}{8}$	5	$8\frac{1}{2}$	$\frac{13}{64}$
7	4	$\frac{1}{2}$	4	3	0	5	$9\frac{3}{8}$	5	$8\frac{1}{2}$	$\frac{3}{16}$
7	6	$\frac{1}{2}$	4	2	4	5	11	5	$10\frac{1}{4}$	$\frac{1}{4}$
7	6	$\frac{1}{2}$	4	2	6	5	11	5	$10\frac{1}{4}$	$\frac{15}{64}$
7	6	$\frac{1}{2}$	4	2	8	5	11	5	$10\frac{1}{4}$	$\frac{7}{32}$
7	6	$\frac{1}{2}$	4	2	10	5	11	5	$10\frac{1}{4}$	$\frac{13}{64}$
7	6	$\frac{1}{2}$	4	3	0	5	11	5	$10\frac{1}{4}$	$\frac{3}{16}$
7	8	$\frac{1}{2}$	4	2	4	6	$0\frac{5}{8}$	5	$11\frac{3}{4}$	$\frac{1}{4}$
7	8	$\frac{1}{2}$	4	2	6	6	$0\frac{5}{8}$	5	$11\frac{3}{4}$	$\frac{15}{64}$
7	8	$\frac{1}{2}$	4	2	8	6	$0\frac{5}{8}$	5	$11\frac{3}{4}$	$\frac{7}{32}$
7	8	$\frac{1}{2}$	4	2	10	6	$0\frac{5}{8}$	5	$11\frac{3}{4}$	$\frac{13}{64}$
7	8	$\frac{1}{2}$	4	3	0	6	$0\frac{5}{8}$	5	$11\frac{3}{4}$	$\frac{3}{16}$
7	10	$\frac{1}{2}$	4	2	4	6	$2\frac{1}{8}$	6	$1\frac{3}{8}$	$\frac{1}{4}$
7	10	$\frac{1}{2}$	4	2	6	6	$2\frac{1}{8}$	6	$1\frac{3}{8}$	$\frac{1}{4}$
7	10	$\frac{1}{2}$	4	2	8	6	$2\frac{1}{8}$	6	$1\frac{3}{8}$	$\frac{15}{64}$
7	10	$\frac{1}{2}$	4	2	10	6	$2\frac{1}{8}$	6	$1\frac{3}{8}$	$\frac{7}{32}$
7	10	$\frac{1}{2}$	4	3	0	6	$2\frac{1}{8}$	6	$1\frac{3}{8}$	$\frac{13}{64}$
8	0	$\frac{1}{2}$	4	2	4	6	$3\frac{3}{4}$	6	3	$\frac{17}{64}$
8	0	$\frac{1}{2}$	4	2	6	6	$3\frac{3}{4}$	6	3	$\frac{1}{4}$
8	0	$\frac{1}{2}$	4	2	8	6	$3\frac{3}{4}$	6	3	$\frac{15}{64}$
8	0	$\frac{1}{2}$	4	2	10	6	$3\frac{3}{4}$	6	3	$\frac{7}{32}$
8	0	$\frac{1}{2}$	4	3	0	6	$3\frac{3}{4}$	6	3	$\frac{13}{64}$
7	0	$\frac{9}{16}$	4	2	4	5	$6\frac{3}{8}$	5	$5\frac{1}{2}$	$\frac{17}{64}$
7	0	$\frac{9}{16}$	4	2	6	5	$6\frac{3}{8}$	5	$5\frac{1}{2}$	$\frac{1}{4}$

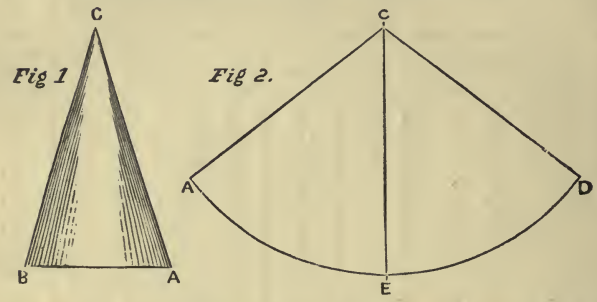
Inside diameter of Tube, Flue, or Boiler.		Thickness of Plate	Number of Plates in the Circle.	Breadth of Plate between centres of rivet holes.		Length of straight line between centres of rivet holes of Large end of Plate.		Length of straight line between centres of rivet holes of Small end of Plate.		Versed line.
FT.	IN.	Parts of an Inch.	No.	FT.	IN.	FT.	IN.	FT.	IN.	Parts of an Inch.
7	0	$\frac{9}{16}$	4	2	8	5	$6\frac{3}{8}$	5	$5\frac{1}{2}$	$\frac{15}{64}$
7	0	$\frac{9}{16}$	4	2	10	5	$6\frac{3}{8}$	5	$5\frac{1}{2}$	$\frac{7}{32}$
7	0	$\frac{9}{16}$	4	3	0	5	$6\frac{3}{8}$	5	$5\frac{1}{2}$	$\frac{13}{64}$
7	2	$\frac{9}{16}$	4	2	4	5	$7\frac{7}{8}$	5	7	$\frac{17}{64}$
7	2	$\frac{9}{16}$	4	2	6	5	$7\frac{7}{8}$	5	7	$\frac{1}{4}$
7	2	$\frac{9}{16}$	4	2	8	5	$7\frac{7}{8}$	5	7	$\frac{15}{64}$
7	2	$\frac{9}{16}$	4	2	10	5	$7\frac{7}{8}$	5	7	$\frac{7}{32}$
7	2	$\frac{9}{16}$	4	3	0	5	$7\frac{7}{8}$	5	7	$\frac{13}{64}$
7	4	$\frac{9}{16}$	4	2	4	5	$9\frac{1}{2}$	5	$8\frac{5}{8}$	$\frac{9}{32}$
7	4	$\frac{9}{16}$	4	2	6	5	$9\frac{1}{2}$	5	$8\frac{5}{8}$	$\frac{17}{64}$
7	4	$\frac{9}{16}$	4	2	8	5	$9\frac{1}{2}$	5	$8\frac{5}{8}$	$\frac{1}{4}$
7	4	$\frac{9}{16}$	4	2	10	5	$9\frac{1}{2}$	5	$8\frac{5}{8}$	$\frac{15}{64}$
7	4	$\frac{9}{16}$	4	3	0	5	$9\frac{1}{2}$	5	$8\frac{5}{8}$	$\frac{7}{32}$
7	6	$\frac{9}{16}$	4	2	4	5	$11\frac{1}{8}$	5	$10\frac{1}{4}$	$\frac{9}{32}$
7	6	$\frac{9}{16}$	4	2	6	5	$11\frac{1}{8}$	5	$10\frac{1}{4}$	$\frac{17}{64}$
7	6	$\frac{9}{16}$	4	2	8	5	$11\frac{1}{8}$	5	$10\frac{1}{4}$	$\frac{1}{4}$
7	6	$\frac{9}{16}$	4	2	10	5	$11\frac{1}{8}$	5	$10\frac{1}{4}$	$\frac{15}{64}$
7	6	$\frac{9}{16}$	4	3	0	.5	$11\frac{1}{8}$	5	$10\frac{1}{4}$	$\frac{7}{32}$
7	8	$\frac{9}{16}$	4	2	4	6	$0\frac{5}{8}$	5	$11\frac{3}{4}$	$\frac{9}{32}$
7	8	$\frac{9}{16}$	4	2	6	6	$0\frac{5}{8}$	5	$11\frac{3}{4}$	$\frac{17}{64}$
7	8	$\frac{9}{16}$	4	2	8	6	$0\frac{5}{8}$	5	$11\frac{3}{4}$	$\frac{1}{4}$
7	8	$\frac{9}{16}$	4	2	10	6	$0\frac{5}{8}$	5	$11\frac{3}{4}$	$\frac{15}{64}$
7	8	$\frac{9}{16}$	4	3	0	6	$0\frac{5}{8}$	5	$11\frac{3}{4}$	$\frac{7}{32}$
7	10	$\frac{9}{16}$	4	2	4	6	$2\frac{1}{4}$	6	$1\frac{3}{8}$	$\frac{19}{64}$
7	10	$\frac{9}{16}$	4	2	6	6	$2\frac{1}{4}$	6	$1\frac{3}{8}$	$\frac{9}{32}$
7	10	$\frac{9}{16}$	4	2	8	6	$2\frac{1}{4}$	6	$1\frac{3}{8}$	$\frac{17}{64}$
7	10	$\frac{9}{16}$	4	2	10	6	$2\frac{1}{4}$	6	$1\frac{3}{8}$	$\frac{1}{4}$
7	10	$\frac{9}{16}$	4	3	0	6	$2\frac{1}{4}$	6	$1\frac{3}{8}$	$\frac{15}{64}$
8	0	$\frac{9}{16}$	4	2	4	6	$3\frac{3}{4}$	6	$2\frac{7}{8}$	$\frac{19}{64}$
8	0	$\frac{9}{16}$	4	2	6	6	$3\frac{3}{4}$	6	$2\frac{7}{8}$	$\frac{9}{32}$

Inside diameter of Tube, Flue, or Boiler.		Thickness of Plate	Number of Plates in the Circle.	Breadth of Plate between centres of rivet holes.		Length of straight line between centres of rivet holes of Large end of Plate.		Length of straight line between centres of rivet holes of Small end of Plate.		Versed line.
FT.	IN.	Parts of an Inch.	No.	FT.	IN.	FT.	IN.	FT.	IN.	Parts of an Inch.
8	0	$\frac{9}{16}$	4	2	8	6	$3\frac{3}{4}$	6	$2\frac{7}{8}$	$\frac{17}{64}$
8	0	$\frac{9}{16}$	4	2	10	6	$3\frac{3}{4}$	6	$2\frac{7}{8}$	$\frac{1}{4}$
8	0	$\frac{9}{16}$	4	3	0	6	$3\frac{3}{4}$	6	$2\frac{7}{8}$	$\frac{15}{64}$
8	2	$\frac{9}{16}$	4	3	0	6	$5\frac{3}{8}$	6	$4\frac{1}{2}$	$\frac{15}{64}$
8	4	$\frac{9}{16}$	4	3	0	6	$6\frac{7}{8}$	6	6	$\frac{15}{64}$
8	6	$\frac{9}{16}$	4	3	0	6	$8\frac{1}{2}$	6	$7\frac{5}{8}$	$\frac{1}{4}$
8	8	$\frac{9}{16}$	4	3	0	6	10	6	$9\frac{1}{8}$	$\frac{1}{4}$
8	10	$\frac{9}{16}$	4	3	0	6	$11\frac{5}{8}$	6	$10\frac{3}{4}$	$\frac{1}{4}$
8	6	$\frac{5}{8}$	4	2	6	6	$8\frac{1}{2}$	6	$7\frac{1}{2}$	$\frac{21}{64}$
8	6	$\frac{5}{8}$	4	2	10	6	$8\frac{1}{2}$	6	$7\frac{1}{2}$	$\frac{9}{32}$
8	6	$\frac{5}{8}$	4	3	0	6	$8\frac{1}{2}$	6	$7\frac{1}{2}$	$\frac{9}{32}$
8	9	$\frac{5}{8}$	4	2	6	6	$10\frac{7}{8}$	6	$9\frac{7}{8}$	$\frac{21}{64}$
8	9	$\frac{5}{8}$	4	2	10	6	$10\frac{7}{8}$	6	$9\frac{7}{8}$	$\frac{19}{64}$
8	9	$\frac{5}{8}$	4	3	0	6	$10\frac{7}{8}$	6	$9\frac{7}{8}$	$\frac{9}{32}$
9	0	$\frac{5}{8}$	4	2	6	7	$1\frac{1}{4}$	7	$0\frac{1}{4}$	$\frac{11}{32}$
9	0	$\frac{5}{8}$	4	2	10	7	$1\frac{1}{4}$	7	$0\frac{1}{4}$	$\frac{5}{16}$
9	0	$\frac{5}{8}$	4	3	0	7	$1\frac{1}{4}$	7	$0\frac{1}{4}$	$\frac{9}{32}$
9	3	$\frac{5}{8}$	4	2	6	7	$3\frac{5}{8}$	7	$2\frac{5}{8}$	$\frac{23}{64}$
9	3	$\frac{5}{8}$	4	2	10	7	$3\frac{5}{8}$	7	$2\frac{5}{8}$	$\frac{5}{16}$
9	3	$\frac{5}{8}$	4	3	0	7	$3\frac{5}{8}$	7	$2\frac{5}{8}$	$\frac{19}{64}$
9	6	$\frac{5}{8}$	4	2	6	7	6	7	5	$\frac{23}{64}$
9	6	$\frac{5}{8}$	4	2	10	7	6	7	5	$\frac{21}{64}$
9	6	$\frac{5}{8}$	4	3	0	7	6	7	5	$\frac{5}{16}$
9	9	$\frac{5}{8}$	5	2	6	6	$1\frac{3}{4}$	6	1	$\frac{1}{4}$
9	9	$\frac{5}{8}$	5	2	10	6	$1\frac{3}{4}$	6	1	$\frac{7}{32}$
9	9	$\frac{5}{8}$	5	3	0	6	$1\frac{3}{4}$	6	1	$\frac{13}{64}$
10	0	$\frac{5}{8}$	5	2	6	6	$3\frac{3}{4}$	6	3	$\frac{1}{4}$
10	0	$\frac{5}{8}$	5	2	10	6	$3\frac{3}{4}$	6	3	$\frac{7}{32}$
10	0	$\frac{5}{8}$	5	3	0	6	$3\frac{3}{4}$	6	3	$\frac{13}{64}$
10	0	$\frac{5}{8}$	5	3	3	6	$3\frac{3}{4}$	6	3	$\frac{3}{16}$

TEMPLATE MAKING.

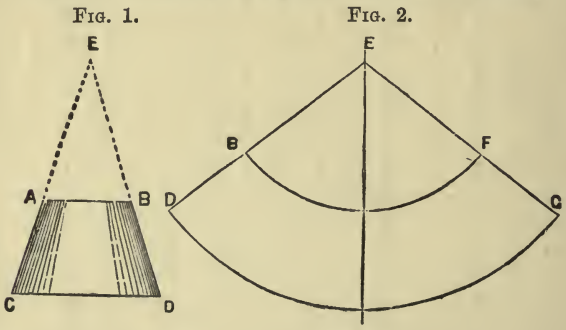
FOR CONES, CYLINDERS, SPHERES, PARABOLAS, &c.

To find the Template for a given Cone.



Let figure 1, A B C, be a given cone whose diameter is A B, and slant edge B C; it is required to find the template. Set your compasses at C as a centre, with the radius C B describe a circle, as A E D, (figure 2,) and make A D equal in length to the required circumference of the base of the cone, then join C D and C A; figure 2, containing C A D E, will then be the template required.

To find the Template for a given Frustum of a Cone.

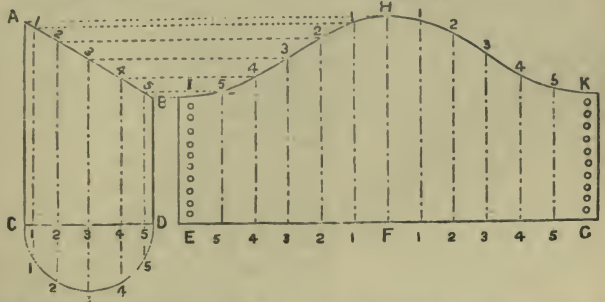


Let A B C D, figure 1, be the frustum of a cone whose base is C D, and height of slant edge B D, it is required to find the template.

Produce A C, B D until they meet at the point E, then from E as a centre, with distance E B as a radius, describe the circle B F, figure 2; and from E as a centre with radius E D describe D G, figure 2; set off D G equal to the required circumference of the base of the cone, and join E G and E D; figure 2, which contains B D F G will then be the template for the frustum required.

To find the template for a given cylinder, having a portion cut off, so that one of the ends shall be at a given angle to its sides.

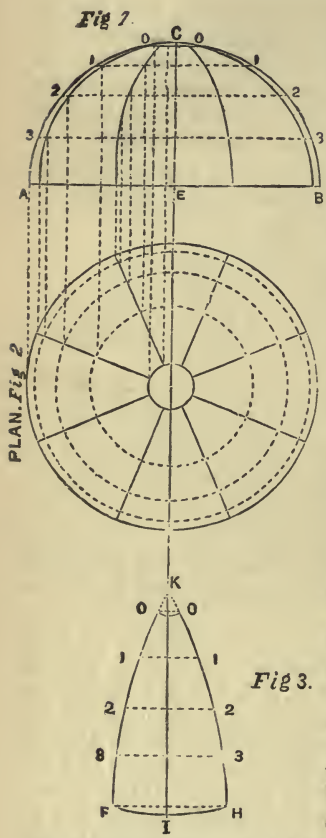
FIG. 1. FIG. 2.



Let A B C D figure 1, be the given cylinder having one of its ends at an angle to the sides, as A B; it is required to find the template.

Upon the base C D draw a semicircle, which divide into a number of equal parts, (the more the better) as 1, 2, 3, 4, 5, through these points draw the lines 1 1, 2 2, 3 3, 4 4, 5 5, parallel to the side C A, of the cylinder; then set off as in figure 2, the line E F G equal in length to the required circumference of the base of the cylinder; then upon E F G mark off on each side of F the same number of equal distances as in semicircle C D, and draw lines as F H, 1 1, 2 2, 3 3, 4 4, 5 5, perpendicular to E F G; F H equal in length to C A, and E I, G K, each equal to D B; also each of the perpendiculars equal to the lines in figure 1, bearing the same figures as 1 1, 2 2, 3 3, 4 4, 5 5, then the line which must be traced through these points, will form one half of the template; the whole of which is contained in figure 2, E I K G.

To find the breadth of the template for a given dome at any particular place, by calculation.



Suppose A B C, figure 1, to be the middle section of the dome, each plate to be a given portion of $\frac{1}{8}$ part of the whole circumference.

Bisect A B at E, and erect a perpendicular as E C; divide the arc B C into a number of equal parts, and through the points of division, 3, 2, 1, 0, draw lines parallel to A B, and since the breadth of the plate is to be $\frac{1}{8}$ of the whole circumference, it is evident that the breadth at points 3, 2, 1, 0, will also be $\frac{1}{8}$ of the circumference at these points; you have therefore only to measure the diameter at those points, and proceed accordingly.

Thus, suppose A B, figure 1, to equal 6 feet diameter, you will find that 3 3, is by measurement, 5 feet $7\frac{5}{8}$ inches; and 2 2, is by measurement 4 feet $7\frac{1}{8}$ inches; and 1 1, is by measurement 2 feet $11\frac{3}{4}$ inches; and 0 0, is by measurement 1 foot.

Then the circumference at A B, figure 1 will equal 18 feet $10\frac{1}{8}$ inches, divided by 8 gives 2 feet $4\frac{1}{4}$ inches for breadth of template at F H, figure 3.

The circumference at 3 3, figure 1, will be 17 feet $8\frac{3}{8}$ inches, divided by 8 gives 2 feet $2\frac{9}{16}$ inches for breadth of template at 3 3, figure 3.

The circumference at 2 2, figure 1, will be 14 feet $5\frac{1}{8}$ inches, divided by 8 gives 1 foot $9\frac{5}{8}$ inches for breadth of template at 2 2, figure 3.

The circumference at 1 1, figure 1 will be 9 feet $4\frac{1}{4}$ inches, divided by 8 gives 1 foot $2\frac{1}{32}$ inches for breadth of template at 1 1, figure 3.

The circumference at 0 0, figure 1 will be 3 feet 1⅝ inches, divided by 8 gives 4$\frac{1}{16}$ inches for breadth of template at 0 0, figure 3.

If you then take the thin plate, of which the template is to be made, and draw upon it a straight line as F H, figure 3, and bisect it by a perpendicular I K, the distance between I and K to measure one fourth part of the circumference of base A B, figure 1, and set off on I K, equal distances, as 3, 2, 1, 0, same as on the dome figure 1, and make the breadth of each point same as found by calculation, you will, upon tracing a line with a thin lath through these points, have the shape of the template required. The distance between K and point 0 or 0, is the radius for describing the curve line at that point. The radius for describing the curve line at F I H may be found by calculation; thus—subtract ordinate 3 3 from ordinate A B, and divide the remainder by 2—this gives the divisor; then say as the divisor is to the radius of the base of dome, as the distance between the two ordinates is to the slant edge of cone. See fig. 2, page 144.

Example.—Ordinate A B=72 inches, minus ordinate 3 3= 67·625 inches=$\frac{4\cdot375}{2}$=2·1875. Then by proportion as 2·1875 inches : 36 inches : : 12·375 inches : slant edge of cone=$\frac{203\cdot6}{12}$ inch=16 feet 11½ inches, the radius required.

To find the Template for a given Short Egg-end Spherical.

Figure 1 is supposed to represent the egg-end, the plates for forming the same are to be overlap jointed, the breadth of each plate to bear an equal portion of the whole circumference, say ⅙ part. The method as laid down in the figures will be very easily understood from the following observations.

Suppose the centre diameter of egg-end to equal 3 feet 11¼ inches, this divided by 2 gives 1 foot 11⅝ inches for radius. The circumference equals 12 feet 4⅜ inches, divided by 6 gives 2 feet ¼ inch breadth of template at A B, figure 3, centre to centre of rivet holes.

In the first place draw a straight line as A B, figure 1, and bisect A B at E, and erect a perpendicular line E C, then with radius of 1 foot 11⅝ inches describe the semicircle; divide the arc *a b c d e* into any number of equal parts, in this case say 5, and through the points of division *a b c d e*, draw lines parallel to A B until they meet at perpendicular E C—this part of the operation is now complete. The semicircle A B, figure 2, is the greatest breadth of template between the centres of rivet holes; bisect the line A B at C, by a perpendicular, divide the arc A D into the same number of equal parts as taken in the arc *a b c d e* figure 1, and draw lines parallel to A B; having done this, take the sheet iron plate for template and draw a straight line at A B and bisect it with a perpendicular, making the distance between E and F to equal one fourth part of the circumference of base A B figure 1. Now set off on E F, equal distances, as *a b c d e*, figure 1, and make the breadth at each point same as A B 2 2, 3 3, 4 4, 5 5, figure 2, drawing the lines parallel to A B; then bend a thin lath round the points, and through them trace the curve lines of both sides of the template. The distance between F and point 5 or 5, is the radius for describing the curve line at that point. The radius for describing the curve line at A E B will be found by making the perpendicular line E C, figure 1, to any length required, then draw the slant edge, intersecting the ordinates at points *a* and *b*, continuing the line until it intersects at the vertex, point 0. The length from *a* to 0 will be the radius required.

NOTE.—It will be observed that one side of the template, figure 3, will have to be the thickness of plate shorter than the other, on account of the overlap, and the long and short sides must both be divided so as to contain the same number of rivet holes; also, the broad end, A B, will have to be divided to correspond with the holes in cylinder end of boiler, or whatever it may have to be joined to.

FIG. 1

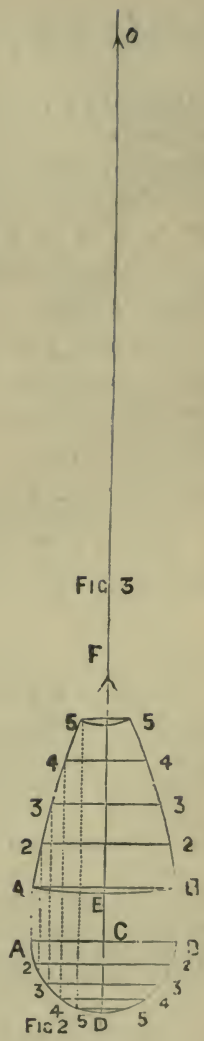


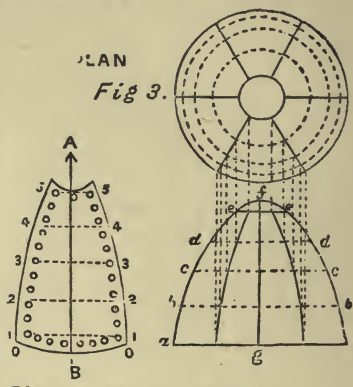
FIG 3

FIG 2

To find the template for a given long Egg-end PARABOLA; *the breadth and length of the template at any particular place.*

Let *a b c d e f*, figure 1, represent the Parabola, the plates to be either over-lap or jump jointed, the breadth of each plate to be a given portion of the whole circumference, say $\frac{1}{6}$ part.

The breadth of the template at each place to be found by calculation, as follows—



Diameter of *a a*=3 feet 6 inches; circumference of *a a*=10 feet $11\frac{7}{8}$ inches÷6=1 foot $9\frac{15}{16}$ inches=breadth of template at points 1 1, figure 2.

Diameter of *b b*=3 feet 2 inches; circumference of *b b*=9 feet $11\frac{3}{8}$ inches÷6=1 foot $7\frac{7}{8}$ inches=breadth of template at points 2 2.

Diameter of *c c*=2 feet 8 inches; circumference of *c c*=8 feet $4\frac{1}{2}$ in.÷6=1 foot $4\frac{3}{4}$ inches=breadth of template at points 3 3.

Diameter of *d d*=1 foot 11 inches; circumference of *d d*=6 feet $\frac{1}{4}$ inch÷6=1 foot=breadth of template at points 4 4.

Diameter of *e e*,=1 foot; circumference of *e e*=3 feet $1\frac{5}{8}$ inches ÷6=$6\frac{1}{4}$ inches=breadth of template at points 5 5.

NOTE—The points are the centres of the rivet holes for over-lap joints.

Now take the sheet iron plate intended for the template and draw upon it a straight line, as 1 1, and bisect it by a perpendicular B A, the distance between B and A to measure the length of half the arc (*a f a*), figure 1, and set off on B A equal distances

as 1, 2, 3, 4, 5, same as on the parabola, *a b c d e*, figure 1, making the breadth at each point same as found by calculation, then by bending a thin lath round the points and tracing a line through them, will give the shape of template required. The length of half the arc (*a f a*,) will be found by the following rule.

Rule—To the square of the ordinate (*a g*) add $\frac{4}{3}$ of the square of the abscissa, (*g f*,) and the square root of the product will be the length of half the arc (*a f a*).

Example

```
     inches.                                    inches.
     21 ordinate a g                             36=abscissa g f
     21                                          36
    ----                                        ----
     21                                         216
    42                                         108
    ----                                       ----
    441 square of ordinate a g                1296=square of
   1728                                          4    [abscissa g f
   ----                                       ----
   2169(46·5 inches=3 feet                  3)5184
   16          10½ inches=length            ----
  ----                                       1728=product of ⅘
86) 569        of half the arc, (a f a)
    516
  ----
925)5300
    4625
    ====
```

The distance between A and point 5 or 5, is the radius for describing the curve line at that point. The radius for describing the curve line at 0 B 0, may be found by calculation, as given in page 179 for the dome, or by attending to instructions laid down in same page for the short egg-end (spherical.)

To find the Templates for a given Barrel SPHEROID; *the breadths and lengths at any particular place, by calculation.*

FIG. 3.

FIG. 1.

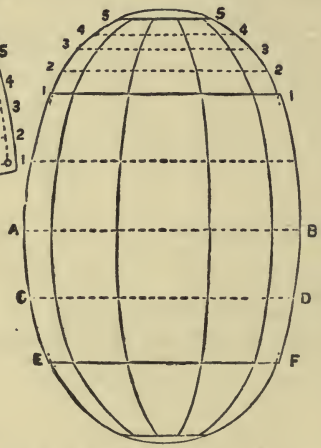
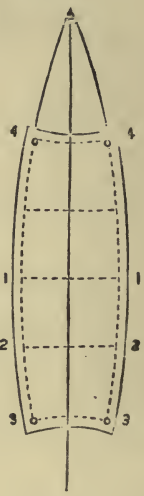


FIG. 2.



Let A B C D E F, figure 1, be one half of the middle frustrum of the barrel; the plates for forming the same are to be over-lap jointed, and the breadth of each plate is to bear an equal portion of the whole circumference of each place, say $\frac{1}{10}$ part.

Thus, the diameter of A B to measure 7 feet 6 inches, the diameter of C D to measure 7 feet 2 inches, the diameter of E F to measure 6 feet 5 inches; then the circumference of A B will equal 23 feet 6¾ inches, which, divided by 10, gives for breadth of template at 1 1, (figure 2) 2 feet 4½ inches, at that point, between centres of rivet holes.

The circumference of C D will equal 22 feet 6 inches, divided by 10, gives for breadth of template at 2 2, 2 feet 3 inches at that point, between centres of rivet holes.

The circumference of E F will equal 20 feet $1\frac{7}{8}$ inches, divided by 10, gives 2 feet $0\frac{3}{16}$ inch for breadth of template at the point 8 3, between centres of rivet holes.

The other half of the frustum will measure the same dimentions as the above calculations.

The length of the arc and the versed sine may be found as follows—

Suppose the cord line to measure 88 inches, this divided by 2 gives 44 inches, and the square of 44 inches equals 1936 inches.

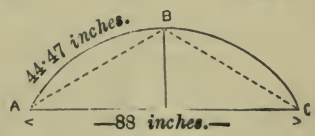
Find the versed sine by taking the difference between the two diameters A B and E F, figure 1, and divide the remainder by 2 :

Thus—A B=7 feet 6 inches.
E F=6 ,, 5 ,,

```
2 ) 1   1
    ---------
    0   6½ inches=versed sine.
```

Then square the versed sine and add the product to the square of ½ the cord, and from their united sum take the square root, which gives the length of cord of half the arc A B, figure 4.

EXAMPLES. FIG. 4.




```
      44
      44
     ----
     176
    176
    -----
    1936=square ½ of cord
      42·25
    -------
    1978·25 ( 44·47=square root.
    16
 84 ) 378
      336
884 ) 4225
      3536
8887 ) 68900
       62209
       =====
```

```
6·5
6·5
---
325
390
---
42·25 square of
versed sine.
```

Now if we take the square root and multiply it by 8, and from the product subtract the whole cord line, and divide the remainder by 3, we shall have the length of the arc nearly.

$$\begin{array}{r} 44{\cdot}47 \\ 8 \\ \hline 355{\cdot}76 \\ 88 \\ \hline 3\,)\;267{\cdot}76 \\ \hline 89{\cdot}25 = 89\tfrac{1}{4} \text{ inches.} \end{array}$$

Consequently the length of the template, figure 2, between centres of the rivet holes 3 and 4, will be 7 feet $5\frac{1}{4}$ inches

Having completed the dimensions of template for middle frustum we proceed to find the template for the spherical or Egg ends of the barrel.

Thus, the diameter of 1 1, figure 1, will equal 6 feet $4\frac{1}{8}$ inches; the diameter of 2, 2, will equal 5 feet $4\frac{1}{8}$ inches; the diameter of 3 3, will equal 4 feet $9\frac{1}{8}$ inches; the diameter of 4 4, will equal 3 feet $7\frac{1}{8}$ inches; the diameter of 5 5, will equal 2 feet $2\frac{1}{8}$ inches.

Then the circumference of 1 1, equals 19 feet $11\frac{1}{8}$ inches $\div 10$ gives for breadth of template at 1 1, figure 3, 1 foot $11\frac{29}{32}$ inches at that point, centre to centre of rivet holes.

The circumference of 2 2, equals 17 feet 10 inches, $\div 10$ gives for breadth of template at 2 2, figure 3, 1 foot $9\frac{3}{8}$ inches at that point, centre to centre of rivet holes.

The circumference of 3 3, equals 14 feet $11\frac{1}{2}$ inches, $\div 10$ gives breadth of template at 3 3, figure 3, 1 foot $5\frac{15}{16}$ inches at that point, centre to centre of rivet holes.

The circumference of 4 4, equals 11 feet $3\frac{1}{2}$ inches, $\div 10$ gives breadth of template at 4 4, figure 3, 1 foot $1\frac{1}{2}$ inch at that point, centre to centre of rivet holes.

The circumference of 5 5, equals 6 feet 10 inches, $\div 10$ gives breadth of template at 5 5, figure 3, $8\frac{3}{16}$ inches at that point, centre to centre of rivet holes.

N.B.—To mark out the template, follow the instructions laid down for the dome, figure 2, page 178, and the template will be the shape required.

THE BOILER-MAKERS'

AND

IRON SHIP-BUILDERS' COMPANION

SECTION VI.

Approximate Rules for finding the Weight of different figures of Wrought Iron and Steel.

RULE 1: *For Round Iron*—Multiply the square of the diameter in inches, by the length in feet, and by 2·63, and the product will be the weight in pounds avoirdupois, *nearly*.

RULE 2: *For Square Iron*—Multiply the area of the end of the bar in inches, by the length in feet, and by 3·36; the product will be the weight in pounds avoirdupois, *nearly*.

RULE 3: *For Square, Angled,* T, *Convex, or any figure of Beam Iron*—Ascertain the area of the end of each figure of bar, in inches, then multiply the area by the length in feet, and that product by 10, and divide by three; the remainder will be the weight in pounds avoirdupois, *nearly*.

RULE 4: *For Square Cast Steel*—Multiply the area of the end of the bar in inches, by the length in feet, and that product by 3·4; the product will be the weight in pounds avoirdupois *nearly*.

RULE 5: *For Round Cast Steel*—Multiply the square of the diameter in inches, by the length in feet, and that product by 2·67; the product will give the weight in pounds avoirdupois, *nearly*.

Examples.

What is the weight of a round bar of wrought iron, 6 feet long and 2 inches diameter?

```
  2 inches diameter.
  2
 ---
  4 square of diameter.
  6 feet, the length.
 ---
 24·
  2·63 multiplier.
 -----
  72
 144
 48
 -----
63·12=2 qrs. 7 lbs.—Ans.
```

What is the weight of a square bar of wrought iron 6 feet long and 2½ inches on side of square?

```
  2·5=2½ inches, side of
  2·5          square.
 -----
  125
 50
 -----
 6·25=area of end of bar.
   6 feet, the length.
 -----
 37·50
  3·36 multiplier.
 -------
  22500
 11250
11250
 --------
126·0000=Ans. 126 lbs.
```

The area of the end of a bar of square angled iron equals 3 square inches; what is the weight of 6 feet in length?

```
  3 square inches=area.
  6 feet, the length.
 ---
 18
  10
 -----
3 | 180
 -----
  60 lbs.=Ans.
```

The area of the end of a bar of convex (or half round iron) is equal to 2¾ square inches; what is the weight of 12 feet?

```
  2·75 square inches==area
    12
 -----
  3300
    10
 -------
3 | 330·00
 -------
  110· lbs.=Ans.
```

TABLE XXVIII.

WEIGHT OF WROUGHT IRON AND STEEL.

METALS.	Weight of a cubic foot in ounces.	Weight of a cubic foot in pounds.	Weight of a cubic inch in parts of a pound.
IRON BARS	7,788	486·8	0·281
STEEL, soft	7,833	489·6	0·283
,, hardened but not tempered	7,840	490·0	0·283
,, tempered but not hardened	7,816	488·5	0·283
,, tempered and hardened ...	7,818	488·6	0·283

TABLE XXIX.

WEIGHT OF BOILER PLATES,

PER SQUARE FOOT.

From $\frac{1}{8}$ of an inch to $1\frac{1}{8}$ inch thick.

Thick ...	$\frac{1}{8}$	$\frac{3}{16}$	$\frac{1}{4}$	$\frac{5}{16}$	$\frac{3}{8}$	$\frac{7}{16}$	$\frac{1}{2}$	$\frac{9}{16}$
	qrs lbs	qrs lbs	qrs lbs	qrs lbs	qrs lbs	qrs lbs	qrs lbs	qrs lbs
Weight...	0 5	0 $7\frac{1}{2}$	0 10	0 $12\frac{1}{2}$	0 15	0 $17\frac{1}{2}$	0 20	0 $22\frac{1}{2}$
Thick ...	$\frac{5}{8}$	$\frac{11}{16}$	$\frac{3}{4}$	$\frac{13}{16}$	$\frac{7}{8}$	$\frac{15}{16}$	1in.	$1\frac{1}{8}$in.
	qrs lbs	qrs lbs	qrs lbs	qrs lbs	qrs lbs	qrs lbs	qrs lbs	qrs lbs
Weight...	0 25	0 $27\frac{1}{2}$	1 2	1 $4\frac{1}{2}$	1 7	1 $9\frac{1}{2}$	1 12	1 17

TABLE XXX.

WEIGHT OF MALLEABLE ROUND IRON, from 1 foot to 5 feet in length.

Size of Iron in inches and parts.	1 FOOT.			2 FEET.			3 FEET.			4 FEET.			5 FEET.		
	qrs.	lbs.	oz.	qrs.	lbs.	oz.	qrs.	lbs.	oz.	qrs.	lbs.	oz.	qrs.	lbs.	oz.
0½	0	0	10	0	1	4	0	1	14	0	2	8	0	3	2
0⅝	0	1	0	0	2	0	0	3	0	0	4	0	0	5	0
0¾	0	1	7	0	2	14	0	4	5	0	5	12	0	7	3
0⅞	0	2	0	0	4	0	0	6	0	0	8	0	0	10	0
1	0	2	10	0	5	4	0	7	14	0	10	8	0	13	2
1⅛	0	3	5	0	6	10	0	9	15	0	13	4	0	16	9
1¼	0	4	2	0	8	4	0	12	6	0	16	8	0	20	10
1⅜	0	4	15	0	9	14	0	14	13	0	19	12	0	24	11
1½	0	5	15	0	11	14	0	17	13	0	23	12	1	1	11
1⅝	0	6	15	0	13	14	0	20	13	0	27	12	1	6	11
1¾	0	8	0	0	16	0	0	24	0	1	4	0	1	12	0
1⅞	0	9	4	0	18	8	0	27	12	1	9	0	1	18	4
2	0	10	8	0	21	0	1	3	8	1	14	0	1	24	8
2⅛	0	11	14	0	23	12	1	7	10	1	19	8	2	3	6
2¼	0	13	5	0	26	10	1	11	15	1	25	4	2	10	9
2⅜	0	14	13	1	1	10	1	16	7	2	3	4	2	18	1
2½	0	16	7	1	4	14	1	21	5	2	9	12	2	26	3
2⅝	0	18	2	1	8	4	1	26	6	2	16	8	3	6	10
2¾	0	19	15	1	11	14	2	3	13	2	23	12	3	15	11
2⅞	0	21	12	1	15	8	2	9	4	3	3	0	3	24	12
3	0	23	11	1	19	6	2	15	1	3	10	12	4	6	7
3¼	0	27	13	1	27	10	2	27	7	3	27	4	4	27	1
3½	1	4	5	2	8	10	3	12	15	4	17	4	5	21	9
3¾	1	9	1	2	18	2	3	27	3	5	8	4	6	17	5
4	1	14	3	3	0	6	4	14	9	6	0	12	7	14	15
4¼	1	19	3	3	10	6	5	1	9	6	20	12	8	11	15
4½	1	25	6	3	22	12	5	20	2	7	17	8	9	14	14
4¾	2	3	5	4	6	10	6	9	15	8	13	4	10	16	9
5	2	9	15	4	19	14	7	1	13	9	11	12	11	21	11
5¼	2	16	8	5	5	0	7	21	8	10	10	0	12	26	8
5½	2	23	9	5	19	2	8	14	11	11	10	4	14	5	13
6	3	10	11	6	21	6	10	4	1	13	14	12	16	25	7
7	4	16	14	9	5	12	13	22	10	18	11	8	23	0	6
8	6	0	5	12	0	10	18	0	15	24	1	4	30	1	9

TABLE XXXI.

WEIGHT OF MALLEABLE SQUARE IRON, from 1 foot to 5 feet in length.

Size of Iron in inches and parts.	1 FOOT.			2 FEET.			3 FEET.			4 FEET.			5 FEET.		
	qrs.	lbs.	oz.	qrs.	lbs.	oz.	qrs.	lbs.	oz.	qrs.	lbs.	oz.	qrs.	lbs.	oz.
0½	0	0	13	0	1	10	0	2	7	0	3	4	0	4	1
0⅝	0	1	5	0	2	10	0	3	15	0	5	4	0	6	9
0¾	0	1	14	0	3	12	0	5	10	0	7	8	0	9	6
0⅞	0	2	9	0	5	2	0	7	11	0	10	4	0	12	13
1	0	3	5	0	6	10	0	9	15	0	13	4	0	16	9
1⅛	0	4	4	0	8	8	0	12	12	0	17	0	0	21	4
1¼	0	5	4	0	10	8	0	15	12	0	21	0	0	26	4
1⅜	0	6	5	0	12	10	0	18	15	0	25	4	1	3	9
1½	0	7	9	0	15	2	0	22	11	1	2	4	1	9	13
1⅝	0	8	14	0	17	12	0	26	10	1	7	8	1	16	6
1¾	0	10	4	0	20	8	1	2	12	1	13	0	1	23	4
1⅞	0	11	13	0	23	10	1	7	7	1	19	4	2	3	1
2	0	13	7	0	26	14	1	12	5	1	25	12	2	11	3
2⅛	0	15	1	1	2	2	1	17	3	2	4	4	2	19	5
2¼	0	17	0	1	6	0	1	23	0	2	12	0	3	1	0
2⅜	0	18	15	1	9	14	2	0	13	2	19	12	3	10	11
2½	0	21	0	1	14	0	2	7	0	3	0	0	3	21	0
2⅝	0	23	2	1	16	4	2	10	6	3	4	8	3	26	10
2¾	0	25	6	1	22	12	2	20	2	3	17	8	4	14	14
2⅞	0	27	12	1	27	8	2	27	4	3	27	0	4	26	12
3	1	2	4	2	4	8	3	6	12	4	9	0	5	11	4
3¼	1	7	7	2	14	14	3	22	5	5	1	12	6	9	3
3½	1	13	2	2	26	4	4	11	6	5	24	8	7	9	10
3¾	1	18	4	3	8	8	4	26	12	6	17	0	8	7	4
4	1	25	12	3	23	8	5	21	4	7	19	0	9	16	12
4¼	2	4	11	4	9	6	6	14	1	8	18	12	10	23	7
4½	2	12	0	4	24	0	7	8	0	9	20	0	12	4	0
4¾	2	19	12	5	11	8	8	3	4	10	23	0	13	14	12
5	3	0	0	6	0	0	9	0	0	12	0	0	15	0	0
5¼	3	8	9	6	17	2	9	25	11	13	6	4	16	14	13
5½	3	17	10	7	7	4	10	24	14	14	14	8	18	4	2
6	4	8	15	8	17	14	12	26	13	17	7	12	21	16	11
7	5	24	10	11	21	4	17	17	14	23	14	8	29	11	2
8	7	19	0	15	10	0	23	1	0	30	20	0	38	11	0

TABLE XXXII.

WEIGHT OF MALLEABLE FLAT IRON.

Thick.	Breadth	1 FOOT.			2 FEET.			3 FEET.			4 FEET.			5 FEET.		
IN	IN.	qrs.	lbs.	oz.	qrs.	lbs.	oz.	qrs.	lbs.	oz.	qrs.	lbs.	oz.	qrs.	lbs.	oz.
⅛	1	0	0	6½	0	0	13	0	1	3½	0	1	10	0	2	0½
	1¼	0	0	8	0	1	0	0	1	8	0	2	0	0	2	8
	1½	0	0	10	0	1	4	0	1	14	0	2	8	0	3	2
	1¾	0	0	11½	0	1	7	0	2	2½	0	2	14	0	3	9½
	2	0	0	13	0	1	10	0	2	7	0	3	4	0	4	1
	2¼	0	0	15	0	1	14	0	2	13	0	3	12	0	4	11
	2½	0	1	0¾	0	2	1½	0	3	2¼	0	4	3	0	5	3¾
	2¾	0	1	2	0	2	4	0	3	6	0	4	8	0	5	10
	3	0	1	4	0	2	8	0	3	12	0	5	0	0	6	4
	3½	0	1	7½	0	2	15	0	4	6½	0	5	14	0	7	5½
	4	0	1	10½	0	3	5	0	4	15½	0	6	10	0	8	4½
	4½	0	1	13½	0	3	11	0	5	8½	0	7	6	0	9	3½
	5	0	2	1½	0	4	3	0	6	4½	0	8	6	0	10	7½
	5½	0	2	4¾	0	4	9½	0	6	14¼	0	9	3	0	11	7¾
	6	0	2	8	0	5	0	0	7	8	0	10	0	0	12	8
	7	0	2	15	0	5	14	0	8	13	0	11	12	0	15	11
¼	1	0	0	13	0	1	10	0	2	7	0	3	4	0	4	1
	1¼	0	1	0	0	2	0	0	3	0	0	4	0	0	5	0
	1½	0	1	4	0	2	8	0	3	12	0	5	0	0	6	4
	1¾	0	1	7	0	2	14	0	4	5	0	5	12	0	7	3
	2	0	1	11¾	0	3	7½	0	5	3¼	0	6	15	0	8	10¾
	2¼	0	1	14	0	3	12	0	5	10	0	7	8	0	9	6
	2½	0	2	1½	0	4	3	0	6	4½	0	8	6	0	10	7½
	2¾	0	2	4¾	0	4	9½	0	6	14¼	0	9	3	0	11	7¾
	3	0	2	8	0	5	0	0	7	8	0	10	0	0	12	8
	3½	0	2	15	0	5	14	0	8	13	0	11	12	0	14	11
	4	0	3	5½	0	6	11	0	10	0½	0	13	6	0	16	11½
	4½	0	3	12	0	7	8	0	11	4	0	15	0	0	18	12
	5	0	4	3	0	8	6	0	12	9	0	16	12	0	20	15
	5½	0	4	9¾	0	9	3½	0	13	13¼	0	18	7	0	23	0¾
	6	0	5	0	0	10	0	0	15	0	0	20	0	0	25	0
	7	0	5	14	0	11	12	0	17	10	0	23	8	1	1	6
	8	0	6	11½	0	13	7	0	20	2½	0	26	14	1	5	9½

WEIGHT OF MALLEABLE FLAT IRON.

Thick.	Breadth	1 FOOT.			2 FEET.			3 FEET.			4 FEET.			5 FEET.		
IN	IN.	qrs.	lbs.	oz.	qrs.	lbs.	oz.	qrs.	lbs.	oz.	qrs.	lbs.	oz.	qrs.	lbs.	oz.
⅜	1	0	1	4	0	2	8	0	3	12	0	5	0	0	6	4
	1¼	0	1	9	0	3	2	0	4	11	0	6	4	0	7	13
	1½	0	1	14	0	3	12	0	5	10	0	7	8	0	9	6
	1¾	0	2	3	0	4	6	0	6	9	0	8	12	0	10	15
	2	0	2	8	0	5	0	0	7	8	0	10	0	0	12	8
	2¼	0	2	13	0	5	10	0	8	7	0	11	4	0	14	1
	2½	0	3	2	0	6	4	0	9	6	0	12	8	0	15	10
	2¾	0	3	7	0	6	14	0	10	5	0	13	12	0	17	3
	3	0	3	12	0	7	8	0	11	4	0	15	10	0	18	12
	3½	0	4	6½	0	8	13	0	13	3½	0	17	10	0	22	0½
	4	0	5	0½	0	10	1	0	15	1½	0	20	2	0	25	2½
	4½	0	5	10½	0	11	5	0	16	15½	0	22	10	1	0	4½
	5	0	6	4½	0	12	9	0	18	13½	0	25	2	1	3	6½
	5½	0	6	14¾	0	13	13½	0	20	12¼	0	27	11	1	6	9¾
	6	0	7	8¾	0	15	1½	0	22	10¼	1	2	3	1	9	11¾
	7	0	8	13	0	17	10	0	26	7	1	7	4	1	16	1
½	1	0	1	10¾	0	3	5½	0	5	0¼	0	6	11	0	8	5¾
	1¼	0	2	1½	0	4	3	0	6	4½	0	8	6	0	10	7½
	1½	0	2	8	0	5	0	0	7	8	0	10	0	0	12	8
	1¾	0	2	15	0	5	14	0	8	13	0	11	12	0	14	11
	2	0	3	5½	0	6	11	0	10	0½	0	13	6	0	16	11½
	2¼	0	3	12	0	7	8	0	11	4	0	15	0	0	18	12
	2½	0	4	3	0	8	6	0	12	9	0	16	12	0	20	15
	2¾	0	4	9¾	0	9	3½	0	13	13¼	0	18	7	0	23	0¾
	3	0	5	0½	0	10	1	0	15	1½	0	20	2	0	25	2½
	3½	0	5	14	0	11	12	0	17	10	0	23	8	1	1	6
	4	0	6	11½	0	13	7	0	20	2½	0	26	14	1	5	9½
	4½	0	7	8½	0	15	1½	0	22	10¼	1	2	3	1	9	11¾
	5	0	8	6	0	16	12	0	25	2	1	5	8	1	13	14
	5½	0	9	3¾	0	18	7½	0	27	11¼	1	8	15	1	18	2¾
	6	0	10	1	0	20	2	1	2	3	1	12	4	1	22	5
	7	0	11	12	0	23	8	1	7	4	1	19	0	2	2	12
	8	0	13	7	0	26	14	1	12	5	1	25	12	2	11	3

WEIGHT OF MALLEABLE FLAT IRON.

hick.	Breadth.	1 FOOT.			2 FEET.			3 FEET.			4 FEET.			5 FEET.		
IN.	IN.	qrs.	lbs.	oz.	qrs.	lbs.	oz.	qrs.	lbs.	oz.	qrs.	lbs.	oz.	qrs.	lbs.	oz.
⅝	1¼	0	2	9¾	0	5	3½	0	7	13¼	0	10	7	0	13	0¾
	1½	0	3	2	0	6	4	0	9	6	0	12	8	0	15	10
	1¾	0	3	10½	0	7	5	0	10	15½	0	14	10	0	18	4½
	2	0	4	3	0	8	6	0	12	9	0	16	12	0	20	15
	2¼	0	4	11½	0	9	7	0	14	2½	0	18	14	0	23	9½
	2½	0	5	4	0	10	8	0	15	12	0	21	0	0	26	4
	2¾	0	5	12	0	11	8	0	17	4	0	23	0	1	0	12
	3	0	6	4¾	0	12	9½	0	18	14¼	0	25	3	1	3	7¾
	3½	0	7	5½	0	14	11	0	22	0½	1	1	6	1	8	11½
	4	0	8	6	0	16	12	0	25	2	1	5	8	1	13	14
	4½	0	9	7	0	18	14	1	0	5	1	9	12	1	19	3
	5	0	10	8	0	21	0	1	3	8	1	14	0	1	24	8
	5½	0	11	8¾	0	23	1½	1	6	10¼	1	18	3	2	1	11¾
	6	0	12	9½	0	25	3	1	9	12½	1	22	6	2	6	15½
	7	0	14	11	1	1	6	1	16	1	2	2	12	2	17	7
	8	0	16	12½	1	5	9	1	22	5½	2	11	2	2	27	14½
¾	1¼	0	3	2	0	6	4	0	9	6	0	12	8	0	15	10
	1½	0	3	12	0	7	8	0	11	4	0	15	0	0	18	12
	1¾	0	4	6½	0	8	13	0	13	3½	0	17	10	0	22	0½
	2	0	5	0½	0	10	1	0	15	1½	0	20	2	0	25	2½
	2¼	0	5	10½	0	11	5	0	16	15½	0	22	10	1	0	4½
	2½	0	6	4¾	0	12	9½	0	18	14¼	0	25	3	1	3	7¾
	2¾	0	6	14¾	0	13	13½	0	20	12¼	0	27	11	1	6	9¾
	3	0	7	9	0	15	2	0	22	11	1	2	4	1	9	13
	3½	0	8	13	0	17	10	0	26	7	1	7	4	1	16	1
	4	0	10	1	0	20	2	1	2	3	1	12	4	1	22	5
	4½	0	11	5	0	22	10	1	5	15	1	17	4	2	0	9
	5	0	12	9	0	25	2	1	9	11	1	22	4	2	6	13
	5½	0	13	13½	0	27	11	1	13	8½	1	27	6	2	13	3½
	6	0	15	1¾	1	2	3½	1	17	5¼	2	4	7	2	19	8¾
	7	0	17	10	1	7	4	1	24	14	2	14	8	3	4	2
	8	0	20	2½	1	12	5	2	4	7½	2	24	10	3	16	12½

WEIGHT OF MALLEABLE FLAT IRON.

Thick.	Breadth.	1 FOOT.			2 FEET.			3 FEET.			4 FEET.			5 FEET.		
IN	IN.	qrs.	lbs.	oz.	qrs.	lbs.	oz.	qrs.	lbs.	oz.	qrs.	lbs.	oz.	qrs.	lbs.	oz.
⅞	1½	0	4	6½	0	8	13	0	13	3½	0	17	10	0	22	0½
	1¾	0	5	2	0	10	4	0	15	6	0	20	8	0	25	10
	2	0	5	14	0	11	12	0	17	10	0	23	8	1	1	6
	2¼	0	6	9½	0	13	3	0	19	12½	0	26	6	1	4	15½
	2½	0	7	5½	0	14	11	0	22	0½	1	1	6	1	8	11½
	2¾	0	8	1	0	16	2	0	24	3	1	4	4	1	12	5
	3	0	8	13	0	17	10	0	26	7	1	7	4	1	16	1
	3½	0	10	4½	0	20	9	1	2	13½	1	13	2	1	23	6½
	4	0	11	12	0	23	8	1	7	4	1	19	0	2	2	12
	4½	0	13	3¾	0	26	7½	1	11	11¼	1	24	15	2	10	2¾
	5	0	14	11	1	1	6	1	16	1	2	2	12	2	17	7
	5½	0	16	2½	1	4	5	1	20	7½	2	8	10	2	24	12½
	6	0	17	10	1	7	4	1	24	14	2	14	8	3	4	2
	7	0	20	9	1	13	2	2	5	11	2	26	4	3	18	13
	8	0	23	8	1	19	0	2	14	8	3	10	0	4	5	8
	9	0	26	7	1	24	14	2	23	5	3	21	12	4	20	3
1	1½	0	5	0½	0	10	1	0	15	1½	0	20	2	0	25	2½
	1¾	0	5	13¾	0	11	11½	0	17	9¼	0	23	7	1	1	4¾
	2	0	6	11½	0	13	7	0	20	2½	0	26	14	1	5	9½
	2¼	0	7	9	0	15	2	0	22	11	1	2	4	1	9	13
	2½	0	8	6	0	16	12	0	25	2	1	5	8	1	13	14
	2¾	0	9	3½	0	18	7	0	27	10½	1	8	14	1	18	1½
	3	0	10	1	0	20	2	1	2	3	1	12	4	1	22	5
	3½	0	11	12	0	23	8	1	7	4	1	19	0	2	2	12
	4	0	13	7	0	26	14	1	12	5	1	25	12	2	11	3
	4½	0	15	2¾	1	2	5½	1	17	8¼	2	4	11	2	19	13¾
	5	0	16	12¾	1	5	9	1	22	6¼	2	11	3	2	27	15¾
	5½	0	18	7½	1	8	15	1	27	6½	2	17	14	3	8	5½
	6	0	20	2½	1	12	5	2	4	7½	2	24	10	3	16	12½
	7	0	23	8	1	19	0	2	14	8	3	10	0	4	5	8
	8	0	26	14	1	25	12	2	24	10	3	23	8	4	22	6
	9	1	2	3¾	2	4	7½	3	6	11¼	4	8	15	5	11	2¾

TABLE XXXIII.

WEIGHT OF ORDINARY ANGLED IRON.

Breadth in Inches and Parts.	Thickness of Root in Inches and Parts.	Thickness in Centre of Web in Inches and Parts.	1 FOOT.			2 FEET.			3 FEET.			4 FEET.			5 FEET.			6 FEET.			7 FEET.		
			qrs.	lbs.	oz.	qrs.	lbs.	oz.	qrs.	lbs.	oz.	qrs.	lbs.	oz.	qrs.	lbs.	oz.	qrs.	lbs.	oz.	qrs.	lbs.	oz.
1¼	⅜	3/16	0	1	7	0	2	14	0	4	5	0	5	12	0	7	3	0	8	10	0	10	1
1¼	7/16	¼	0	1	14	0	3	12	0	5	10	0	7	8	0	9	6	0	11	4	0	13	2
1½	⅜	3/16	0	1	12	0	3	8	0	5	4	0	7	0	0	8	12	0	10	8	0	12	4
1½	7/16	¼	0	2	6	0	4	12	0	7	2	0	9	8	0	11	14	0	14	4	0	16	10
1¾	7/16	¼	0	2	11	0	5	6	0	8	1	0	10	12	0	13	7	0	16	2	0	18	13
1¾	½	5/16	0	3	3	0	6	6	0	9	9	0	12	12	0	15	15	0	19	2	0	22	5
2	½	¼	0	3	2	0	6	4	0	9	6	0	12	8	0	15	10	0	18	12	0	21	14
2	9/16	5/16	0	3	13	0	7	10	0	11	7	0	15	4	0	19	1	0	22	14	0	26	11
2¼	⅝	⅜	0	5	1	0	10	2	0	15	3	0	20	4	0	25	5	1	2	6	1	7	7
2¼	¾	7/16	0	5	13	0	11	10	0	17	7	0	23	4	1	1	1	1	6	14	1	12	11
2½	⅝	⅜	0	5	12	0	11	8	0	17	4	0	23	0	1	0	12	1	6	8	1	12	4
2½	¾	7/16	0	6	10	0	13	4	0	19	4	0	26	8	1	5	2	1	11	2	1	18	6
2½	¾	½	0	7	5	0	14	10	0	21	15	1	1	4	1	8	9	1	15	14	1	23	3
2¾	¾	7/16	0	7	6	0	14	12	0	22	2	1	1	8	1	8	14	1	16	4	1	23	10
2¾	¾	½	0	8	5	0	16	10	0	24	15	1	5	4	1	13	9	1	21	14	2	2	3
3	⅝	7/16	0	8	1	0	16	2	0	24	3	1	4	4	1	12	8	1	20	9	2	0	10
3	⅞	½	0	9	3	0	18	6	0	27	9	1	8	12	1	17	15	1	27	2	2	8	5

WEIGHT OF ORDINARY ANGLED IRON.

3	7/8	5/8	0	11	3	0	22	6	1	5	9	1	16	12	1	27	15	2	11	2	2	22	5
3 1/4	3/4	7/16	0	8	13	0	17	10	0	26	7	1	7	4	1	16	1	1	24	14	2	5	11
3 1/4	1	5/8	0	12	0	0	24	0	1	8	0	1	20	0	2	4	0	2	16	0	3	0	0
3 1/4	1 1/8	3/4	0	14	6	1	0	12	1	15	2	2	1	8	2	15	14	3	2	4	3	16	10
3 1/2	1	5/8	0	13	4	0	26	8	1	11	12	1	25	0	2	10	4	2	23	8	3	8	12
3 1/2	1 1/8	3/4	0	15	10	1	3	4	1	18	14	2	6	8	2	22	2	3	9	12	3	25	6
3 3/4	3/4	1/2	0	11	10	0	23	4	1	6	14	1	18	8	2	2	2	2	13	12	2	25	6
3 3/4	7/8	5/8	0	14	5	1	0	10	1	14	15	2	1	4	2	15	9	3	1	14	3	16	3
4	5/8	1/2	0	12	8	0	25	0	1	9	8	1	22	0	2	6	8	2	19	0	3	3	8
4	3/4	5/8	0	15	5	1	2	10	1	17	15	2	5	4	2	20	9	3	7	14	3	23	3
4	1	3/4	0	18	2	1	8	4	1	26	6	2	16	8	3	6	10	3	24	12	4	14	14
4 1/2	5/8	1/2	0	14	2	1	0	4	1	14	6	2	0	8	2	14	10	3	0	12	3	14	14
4 1/2	3/4	5/8	0	17	7	1	6	14	1	24	5	2	13	12	3	3	3	3	20	10	4	10	1
4 1/2	1	3/4	0	20	0	1	13	4	2	5	14	2	26	8	3	19	2	4	11	2	5	3	2
5	5/8	3/8	0	12	0	0	24	0	1	8	0	1	20	0	2	4	0	2	16	0	3	0	0
5	3/4	1/2	0	15	13	1	3	10	1	19	7	2	7	4	2	23	1	3	10	14	3	26	11
5	1	5/8	0	19	8	1	11	0	2	2	8	2	22	0	3	13	8	4	5	0	4	24	8
5	1 1/8	3/4	0	23	2	1	18	4	2	13	6	3	8	8	4	3	10	4	26	12	5	21	14
3 1/4 × 3 3/4	1	5/8	0	13	4	0	26	8	1	11	12	1	25	0	2	10	4	2	23	8	3	8	12
4 × 2 1/2	3/4	3/8	0	7	10	0	15	4	0	22	14	1	2	8	1	10	2	1	17	12	1	25	6
4 × 3	7/8	7/16	0	9	8	0	19	0	1	0	8	1	10	0	1	19	8	2	1	0	2	10	8
4 3/4 × 3	7/8	1/2	0	12	0	0	24	0	1	8	0	1	20	0	2	4	0	2	16	0	3	0	0
5 × 3	1	1/2	0	12	8	0	25	0	1	9	8	1	22	0	2	6	8	2	19	0	3	3	8
6 × 3	3/4	7/16	0	12	5	0	24	10	1	8	15	1	21	4	2	5	9	2	17	14	3	2	3
6 × 3 1/4	1	1/2	0	14	9	1	1	2	1	15	11	2	2	4	2	16	13	3	3	6	3	14	15

TABLE XXXIV.

WEIGHT OF A SUPERFICIAL SQUARE FOOT OF PLATE OR SHEET IRON.
Thickness measured by the Birmingham Wire Guage.

No. of the Wire Guage.	Thickness in Parts of an Inch.	Weight in Pounds and Ounces.		No. of the Wire Guage.	Thickness in Parts of an Inch.	Weight in Pounds and Ounces.	
		lbs.	oz.			lbs.	oz.
1	$\frac{5}{16}$	12	8	16	$\frac{1}{16}$	2	8
2		12	0	17		2	$2\frac{3}{4}$
3		11	0	18		1	$12\frac{3}{4}$
4	$\frac{1}{4}$	10	0	19		1	11
5		8	12	20		1	$8\frac{1}{2}$
6		8	2	21		1	$6\frac{1}{2}$
7	$\frac{3}{16}$	7	8	22	$\frac{1}{32}$	1	4
8		6	13	23		1	2
9		6	4	24		1	0
10		5	10	25		0	$14\frac{1}{4}$
11	$\frac{1}{8}$	5	0	26		0	$12\frac{3}{4}$
12		4	6	27		0	$11\frac{1}{2}$
13		3	12	28	$\frac{1}{64}$	0	10
14		3	2	29		0	9
15		2	13	30		0	8

TABLE XXXV.

FOR ASCERTAINING THE WEIGHT OF MALLEABLE IRON PIPES,
12 inches long, of various thicknesses and diameters.

Thickness in Parts of an Inch.	Decimal lbs.	Thickness in Parts of an Inch.	Decimal lbs.	Thickness in Parts of an Inch.	Decimal lbs.	Thickness in Parts of an Inch.	Decimal lbs.
$\frac{1}{32}$	·104	$\frac{1}{8}$	·416	$\frac{7}{32}$	·729	$\frac{3}{8}$	1·250
$\frac{1}{16}$	·208	$\frac{5}{32}$	·520	$\frac{1}{4}$	·833	$\frac{7}{16}$	1·459
$\frac{3}{32}$	·3125	$\frac{3}{16}$	·625	$\frac{5}{16}$	1·041	$\frac{1}{2}$	1·666

RULE—Multiply the circumference of the pipe in inches, by the decimal numbers opposite the thickness required, and by the length in feet—the product will be the weight in pounds avoirdupois *nearly*.

EXAMPLE—Required the weight of a pipe 6 feet long, 12 inches in circumference, and $\frac{1}{16}$ of an inch thick :

Here ·208 lbs. × 12 × 6=14·976 lbs.=14 lbs. $15\frac{1}{2}$ oz. *nearly*.

THE BOILER-MAKERS'

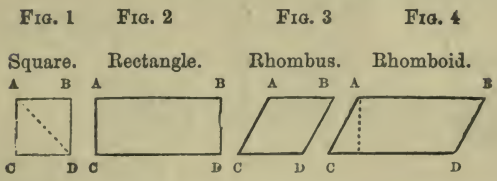
AND

IRON SHIP-BUILDERS' COMPANION.

SECTION VII.—Miscellaneous.

Mensuration of Surfaces.

Four-Sided Figures.



To find the area of a four-sided figure, whether it be a square, a rectangle, a rhombus, or a rhomboid.

Rule—Multiply the length, A B, or C D, by the breadth or perpendicular height; the product will be the area.

Examples.

Required the superficial content of a plate of iron, measuring 2 feet 6 inches, on the side of square. Figure 1.

2·5=2 feet 6 inches.
2·5

125
50

6·25=6¼ square feet.

N.B.—For the weight of a square foot of plate iron, according to its thickness—see table 29, page 187.

What is the number of superficial square feet contained in a plate of iron measuring 6 feet 9 inches long, by 3 feet 3 inches wide?—Fig. 2.

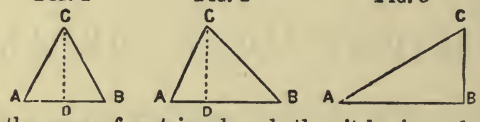
6·75=6 feet 9 inches.
3·25=3 feet 3 inches.

3375
1350
2025

21·9375=21 feet 11¼ in., or nearly 22 square feet

Triangles.

Fig. 1 Fig. 2 Fig. 3



To find the area of a triangle, whether it be isosceles, scalene, or right-angled.

Rule.—Multiply the base A B, by the perpendicular C D, and half the product will be the area.

Examples.

Required the area of a triangle, whose base is 32 inches, and perpendicular 40 inches.—Fig. 1.

32
40
2) 1280

640 square inches=area

How many square feet are there in a triangle, whose base is 8 feet 3 in and perpendicular 7 feet 6 inches?—Fig. 2.

8·25=8 feet 3 inches.
7·5=7 feet 6 inches.

4125
5775
2) 61·875

30·935=30 sq. ft. 11 inches, nearly.

Any two sides of a right-angled triangle being given, to find the third side.

Rule 1.—When the base, A B, and perpendicular C B, are given, to find the hypothenuse, or longest side; to the square of the base add the square of the perpendicular, the square root of the sum will give the longest side.

RULE 2.—When the hypothenuse or longest side A C, and one side are given, to find the other side; from the square of the hypothenuse subtract the square of the given side, the square root of the remainder will be the side required.*

EXAMPLES.

Given the base A B,=32 inches, the perpendicular B C,=24 inches, required the length of the longest side A C.—Fig. 3.

```
 24        32
 24        32
 --        --
 96        64
48        96
----      ----
576       1024
           576
          1600 (40 in.=longest
          16          side.
          --
```

Given the base A B, 32 inches, and longest side 40 inches; required the length of the perpendicular B C. —Fig. 3.

```
 32        40
 32        40
 --        --
 64      1600
96       1024
1024      576 (24 in.=perpen-
           4        dicular B C.
       44 ) 176
            176
```

NOTE—The diagonal line, or hypothenuse in a square is equal to the square root of twice the square of the side; and the side of a square is equal to the square root of half the square of its diagonal.

EXAMPLES.

Suppose each side of a square to equal 24 inches; find the diagonal.

```
      24 in=A B Fig. 1 page 197
      24
      --
      96
     48
     ----
     576
       2
    1152·( 33·94 in.=the diagonal
      9          line from A to D.
 63 ) 252
      189
 669) 6300
      6021
 6784 ) 27900
        27136
        -----
          774 rem.
```

The diagonal line of a square measures 34 inches; find the side of square equal thereto.

```
     34=A D, Fig. 1. page—
     34
     --
    136
   102
 2 )1156
    578·( 24· inches=side of square
      4
 44 ) 178
      176
      ---
        2 rem.
```

* The truth of these rules is evident from the 1st book of Euclid, 47 prop.

Trapezoids and Trapeziums.

Fig. 1

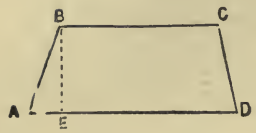
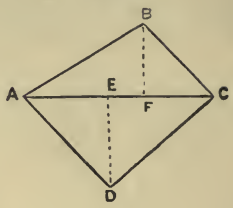


Fig. 2



To find the area of a Trapezoid.

Rule—Add together the two parallel sides A D and B C, multiply their sum by the distance between them—B E, and half the product is the area.

To find the area of a Trapezium.

Rule.—Divide the trapezium into two triangles by the diagonal line A C, and let two perpendiculars, B F and D E, fall on the diagonal from the opposite angles; then multiply the sum of these perpendiculars by the length of the diagonal, and divide by 2, which will give the area.

Examples.

What is the area of a trapezoid whose parallel sides are 7 feet 6 in., and 9 feet 9 inches, the perpendicular distance 7 feet?—Fig. 1.

7·5=7 feet 6 inches.
9·75=9 feet 9 inches.

17·25
7 feet
2) 120·75

60·375=Ans.

Required the area of a trapezium A B C D, the diagonal A C 5 feet, D E 4 feet 2 inches, and B F 3 feet 4 inches.—Fig. 2.

B F 4·166=4 feet 2 inches
D E 3·333=3 „ 4 „

7·499
5 feet=A C
2) 37·495

18·7475=18¾ square feet nearly.

The Circle.

To find the circumference of a circle when the diameter is given; or the diameter when the circumference is given.

Rule 1.—Multiply the diameter by 3·1416 and the product will be the circumference; or divide the circumference by 3·1416 and the quotient will be the diameter.

Rule 2.—As 7 is to 22 so is the diameter to the circumference; and as 22 is to 7 so is the circumference to the diameter.

Examples.

Required the circumference of a circle when the diameter is 3 feet.

3·1416
3 feet=diameter

9·4248=9 feet 5 inches.

What is the diameter of a circle when the circumference is 9·4248 feet?

3·1416) 9·4248 (3 feet diameter.
9·4248

What is the circumference of a circle when the diameter is 36 in.?

as 7 : 22 :: 36
22
72
72
7) 792

$113\frac{1}{7}$ inches. = circum.

Required the diameter of a circle when the circumference is $113\frac{1}{7}$ in.

As 22 : 7 :: $113\frac{1}{7}$ inches.
7
22) 792 (36 in=diameter
66
132
132

To find the area of a circle.

Rule 1.—Multiply the square of the diameter by ·7854, or the square of the circumference by ·07958; the product in either case will be the area.

Rule 2.—Multiply the circumference by the diameter, and divide the product by 4.

Examples.

Required the area of a circle, the diameter being 3 feet. By rule 1.

·7854
9=3^2 feet.

7·0686=Ans.

What is the area of a circle when the diameter is 3 feet, and circumference 9·4248 feet? By rule 2.

9·4248 circumference.
3 diameter.
4) 28·2744

7·0686=Ans.

The area of a circle given, to find the diameter or circumference

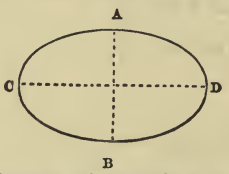
Rule.—Divide the area by ·7854, the square root of the quotient will give the diameter; then find the circumference by the common number 3·1416.

Example.—Required to find the diameter and circumference of a circle, whose area is 452·3904 square inches.

```
·7854 ) 452·3904 ( 576·
        39270
        ------
         59690
         54978
         ------
          47124
          47124
          =====
```

```
      576· ) 24 inches=diameter
      4
   44 ) 176
        176
        ===
      3·1416
          24
      ------
      125664
      62832
      ------
      75·3984=75⅜ inches, the circumference.
      ===
```

Ellipse or Oval.



To find the circumference of an ellipse or oval.

Rule—Add the length of the two axes, A B and C D together, and multiply the sum by 1·5708, the product will be the circumference; or, multiply the sum of the transverse and conjugate diameters by 3·1416, and half the product is the circumference, or near enough for most practical purposes.

Examples.

Required the length of an elliptic curve, whose conjugate A B is 40 inches and transverse C D 60 inches

```
 40        1·5708
 60            100
----       -------
100        157·0800 inches=Ans.
===        ========
```

What is the length of the circumference, when the diameters are 30 and 40 inches?

```
 30          3·1416
 40              70
 --       2 ) 219.9120
 70          --------
            109·956 inches=Ans.
            =======
```

To find the area of an ellipse or oval.

RULE.—Multiply the transverse diameter C D, by the conjugate A B, and the product by ·7854, and the last product is the area.

EXAMPLES.

Required the area of an ellipse, whose transverse and conjugate are 20 and 10 feet.

20	·7854
10	200
200	157·0800=area.

What is the area of an ellipse, whose two axes are 14 and 12 feet?

14	·7854
12	168
168	62832
	47124
	7854
	131·9472=area.

Mensuration of Solids.

FIG. 1

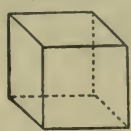
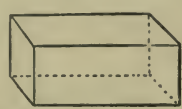


FIG. 2



To find the superficies and solidity of a cube.

FOR SUPERFICIES.

RULE.—Multiply the area of one of its sides by 6, and the product will be the area of the cube.

FOR THE SOLIDITY.

RULE.—Multiply the side of the cube by itself, and that product again by the side; the last product will be the solidity of the given cube.

EXAMPLES.

Required the superficies of a cube whose side is 28 inches.—Fig. 1.

28
28
224
56
784 area of one of the sides.
6
4704=the superficies in square inches.

What is the solidity of a cube whose side is 8 feet?

8
8
64
8
512 solid feet=Ans.

To find the superficies and solidity of a parallelopipedon.

For Superficies.

Rule.—Multiply the perimeter of the end by the length; to the product add twice the area of the end, and the sum will be the superficies.

For the Solidity.

Rule.—Multiply the area of the end by the length, and the product will be the solidity.

Examples.

Required the superficies of a parallelopipedon whose length is 6 feet, breadth 3 feet, and thickness 2 feet.—Fig. 2.

2 + 2 = 4	3
3 + 3 = 6	2
10 perimeter	6 area of end.
6	2
60	12 area of both ends.
12 add.	
72 square feet = Ans.	

What is the solidity of a parallelopipedon, whose length is 12 feet, breadth 6 feet, and depth 4 feet?

6
4
24 area of end.
12 length.
288 cubic feet = Ans.

Cylinders and Prisms.

Fig. 1

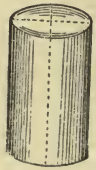
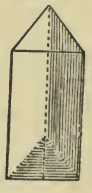


Fig. 2



To find the solidity of cylinders and prisms.

Rule.—Multiply the area of the base by the height of the cylinder or prism, and the product will give the solid content.

Examples.

Required the solid content of a cylinder whose base is 3 feet and height 6 feet.

$3 \times 3 = 9$

```
 ·7854
     9
 ------
7·0686 area of base.
     6 height of cylinder.
 ------
42·4116 cubic feet=Ans.
```

What is the solid content of a prism, whose length is 72 inches, base 32 inches, and perpendicular height 40 inches?

Here $32 \times 40 \div 2 = 640$ sq. in. the area
72 the length.

```
 1280
4480
 ------
46080 cubic in.=Ans
```

To find the convex surface of a cylinder.

Rule—Multiply the circumference by the length of the cylinder; the product will be the convex surface required.

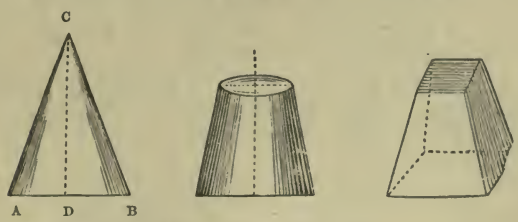
Example.—What is the convex surface of a cylinder, whose base equals 3 feet, and perpendicular height 6 feet?

Here $3{\cdot}1416 \times 3 \times 6 = 56{\cdot}5488$ square feet=Ans.

Cones and Pyramids.

Cone or Pyramid. Frustum of a Cone. Frustum of a Pyramid.

Fig. 1. Fig. 2. Fig. 3.



To find the solidity of a cone or pyramid.

Rule.—Multiply the area of the base A B, by the perpendicular height C D, and one third of the product will be the content.

Example—What is the solidity of a cone or pyramid, whose area of base equals 1017·8784 square inches, the perpendicular height being 50 inches?

Here $1017{\cdot}8784 \times 50 = \frac{50893{\cdot}64}{\frac{1}{3}} = \frac{16964{\cdot}92}{1728} = 9{\cdot}81$ cubic feet

To find the solidity of the frustum of a cone.

RULE.—To the product of the diameters of the two ends, add the sum of their squares; multiply this sum by the perpendicular height and by ·2618, the product will be the solid content.

EXAMPLE.—What is the solidity of the frustum of a cone, whose perpendicular height is 20 inches, the greater diameter 32, and lesser 24 in.?

```
Here 24×32= 768
     24²= 576
     32²=1024
          ----
          2368
            20 =height.
          ----
          47360
          ·2618 =multiplier.
          ------
          378880
          47360
        284160
        94720
        ---------
        12398·8480 cubic inches.
        ---------
          1728=7.175 cubic feet=Ans.
```

To find the solidity of the frustum of a pyramid.

RULE.—Add to the areas of the two ends of the frustum the square root of their product, and this sum multiplied by one third of the height will give the solidity.

EXAMPLE.—Required the solid content of the frustum of a pyramid, whose perpendicular height is 48 inches, the area of the base 288 square inches, and area of top end 128 square inches.

```
Here 288+128= ........................ 416
      128                              192
     ----                            ----
     2304                             608
     576                              16 = 1/3 of height.
    288                              ----
    ------                           3648
    36864 ( 192 sqr. root.           608
    1                                ----
29 ) 268                             9728 = cubic inches
     261                                      =Ans.
382 ) 764
      764
```

To find the convex surface of a right cone or pyramid, also to find the convex surface of a frustum of a right cone or pyramid.

RULE 1.—Multiply the perimeter or circumference of the base by the slant height, or length of the side of the cone, and half

the product will be the slant surface, to which add the area of the base, and the product will be the whole surface.

Rule 2.—Multiply the sum of the perimeters of the two ends by the slant height or side of the frustum, and half the product will be the slant surface; to which add the areas of the two ends, and the product will be the whole surface.

Examples.

Required the convex surface of a right cone whose diameter of base is 10 inches, and slant height 36 in.

```
   31·416
       10 in.=diameter of
                    base.
   31·4160
       36 in.=slant height
                    ·7854
   1884960            100
   942480          ------
2) 1130·9760       78·5400
   ---------
   565·488  convex surface=
    78·54  area of base.  [Ans.
   ---------
   644·028
   ---------
    144=4·472 square feet the
   =======      whole superfices
```

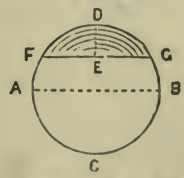
What is the convex surface of the frustum of a right cone, the diameter at the greater end being 10, at the lesser 6 inches, and slant height 15½ inches?

```
·7854 × 100=78·54
·7854 × 36= 28·2744
            ---------
            106·8144
3·1416 × 10=31·4160
3·1416 ×  6=18·8496
            ---------
            50·2656
                15·5=15½ inches.
            ---------
            2513280
            2513280
            502656
          2)779·11680
            ---------
            389·5584  convex sur-
            106·8144      face=Ans
            ---------
            496·3728 square in., the
            =======whole superfi-
                      cies.
```

Spheres and Segments of Spheres.

Fig. 1.

Fig. 2.



To find the solid content and convex surface of a sphere or globe; also to find the solid content and convex surface of the segment of a sphere or globe.

RULE 1.—Multiply the cube of the diameter by ·5236, and the product is the solid content.

RULE 2.—Multiply the square of the diameter A B, by 3·1416, the product will be the convex superficies.

RULE 3.—Add the square of the height, E D, to three times the square of the radius of the base F G; multiply that sum by the height and by ·5236, and the product is the solid content.

RULE 4.—Multiply the height of the segment by the whole circumference of the sphere, and the product is the convex or curved surface.

EXAMPLES.

Required the solid content of a sphere whose diameter equals 12 in.

```
      12 diameter.
      12
     ---
     144
      12
     ----
    1728 cube.
   ·5236 multiplier.
   -------
   10368
   5184
  3456
 8640
 ---------
 904·7808 cubic inches=Ans.
```

Required the solid content of a spherical segment, whose height is 8 inches, and radius of the base 16 inches.

```
Here 8²=  64
 16²×3=768
       ----
        832
          8 the height.
       ----
       6656
      ·5236 multiplier.
      -----
      39936
     19968
    13312
   33280
   ----------
   3485·0816 cubic inches
   ==========  =Ans.
```

What is the convex surface of a sphere, the diameter being 12 in.?

```
      12 diameter.
      12
     ----
     144 square.
   3·1416 multiplier.
   -------
     864
    144
   576
  144
 432
 ---------
 452·3904 square inches=Ans.
```

What is the surface of a segment of a sphere, whose height is 8 in., the diameter being 50 inches?

```
  3·1416
      50
  -------
 157·0800 the circumference.
        8 the height.
  -------
 1256·6400 square inches=Ans
```

Liquid Measuring.

In measuring vessels for containing liquids they are computed as if they were real solids, their contents being reduced to imperial gallons. The imperial gallon contains 277·274 cubic inches.

To find the number of imperial gallons contained in any square or rectangular cistern or tank.

Rule.—Find the content of the cistern in cubic feet and parts, then multiply the sum by 6·232, or find the content of cistern in cubic inches and parts, and multiply the sum by ·003607; the product in either case will be the number of imperial gallons.

Examples.

A cistern is 2 feet 6 inches on the side of square, and 7 feet long; how many gallons will it contain?—Fig. 1 page 197.

Here $2{\cdot}5^2$=area of square
6·25 square feet.
7 feet fong.

43·75
6·232=multiplier.

8750
13125
8750
26250

272·65000 gallons=Ans.

A rectangular tank measuring 6 feet 9 inches long, 3 feet 3 inches wide, and 5 feet deep; what number of gallons will it contain?—Fig. 2, page 197.

Here $6{\cdot}75 \times 3{\cdot}25 \times 5 =$
109·6875 cubic feet.
6·232 multiplier.

2193750
3290625
2193750
6581250

683·5725000 gals.=Ans.

Any two dimensions of a square or rectangular cistern or tank being given, to find the third that shall contain any number of imperial gallons required.

Rule.—Multiply the number of gallons that the cistern or tank is required to contain by ·16046 for feet, or by 277·274 for inches, according as the dimensions are given in feet or inches, divide this product by the products of the two given dimensions, and the quotient will be the third dimension of the cistern or tank, nearly.

Examples.

What will be the depth of a tank o contain 1600 gallons, the length being $8\frac{1}{2}$ feet, and width $6\frac{3}{4}$ feet?

```
  6·75   ·16046
   8·5       1600 gallons.
  ----    -------
  3375    9627600
 5400     16046
57·375 ) 256·73600(4·5 feet the
         229500        depth.
         -------       =Ans.
          272360
```

Required the length of a cistern to contain $6\frac{1}{4}$ gallons, the depth being 8 inches and width 12 inches.

```
                277·274
                   6·25 gallons.
                -------
inches.         1386370
  12             554548
   8            1663644
  ---------------------
  96 )1732·96250( 18 in. the
      96          length=Ans
      ---
      772
      768
      ---
       49
```

To find the content of a cylinder in imperial gallons.

Rule 1.—Multiply the square of the diameter in feet by the length of the cylinder, also in feet, and by 4·895.

Rule 2.—Multiply the square of the diameter in inches by the length in feet, and by ·034.

Rule 3.—Multiply the square of the diameter in inches by the length, also in inches, and by ·00283, and the product will be the content in gallons, nearly.

Examples.

What number of gallons will a cylindrical cistern contain, the diameter being 8 feet, and length 12 feet?

```
8²=64 square of diameter.
   12
  ---
  768
 4·895 multiplier.
 -----
 3840
 6912
6144
3072
-------
3759·360 gallons=Ans.
```

How many gallons are contained in a cylinder whose diameter is 15 inches and length 20 inches?

```
15²=225 square of diameter
     20
    ----
    4500
   ·00283
   ------
   13500
  36000
  9000
  -------
  12·73500 gallons=Ans.
```

The length of a cylinder given, to find the diameter, or the diameter given, to find the length that shall contain any number of imperial gallons required.

Rule 1.—Multiply the number of gallons that the cylinder is required to contain by ·2043, divide the product by the length in feet, and the square root of the quotient will be the diameter in feet and parts of a foot.

Rule 2.—Multiply the number of gallons by ·2043, and divide the product by the square of the diameter in feet, and the quotient is the length in feet and parts of a foot; and if the dimensions are given in inches in place of feet, use 353 in place of ·2043.

Examples.

Required the diameter of a cylinder to contain 16 gallons, when the length is 2 feet 6 inches.

Here $16 \times \cdot 2043 = 3\cdot 2688 \div 2\cdot 5 = 1\cdot 3075$

```
        1·3075 (1·1434 sqr. root=
        1          1 foot 1¾ in. the
   21 ) 30         diameter requir-
        21         ed.
  224 ) 975
        896
 2283) 7900
       6849
22894) 105100
       91456
```

What is the length of a cylinder to contain 16 gallons, the diameter being 13·72 inches?

```
   13·72
   13·72
   ------     353
    2744       16
   9604       ----
  4116       2118
 1372        353
188·2384 ) 5648·000(30· in.=Ans.
           5647·152
```

To find the content of a sphere or globe in imperial gallons.

Rule—Multiply the cube of the diameter in feet, by 3·263, or, multiply the cube of the diameter in inches by ·001888, and the product in either case will be the content in gallons.

Note.—The weight of a cubic foot of water equals 62·5 lbs. avoirdupois.
Weight of a cubic inch equals ·03617 lbs. avoirdupois.
Weight of a column of water 12 inches high and 1 inch square, equals ·434 lbs, avoirdupois.
Weight of a cylindrical foot of water equals 49·1 lbs. avoirdupois.
Weight of a cylindrical inch equals ·02842 lbs. avoirdupois.
Weight of a cylindrical column of water 12 inches high and 1 inch diameter equals ·341 lbs. avoirdupois.

11·2 imperial gallons of water = 1 cwt.
224 imperial gallons of water = 1 ton.
1·8 cubic feet of water - - = 1 cwt.
35·84 cubic feet of water - - = 1 ton.
1 cubic foot of water - - = 6·232 imperial gallons.
1 cylindrical foot of water = 4·895 imperial gallons.

EXAMPLE.—What is the weight of a cylindrical column of water the diameter being 18 inches, and height 12 feet.

Here $18^2 \times 12 = 3888 \times 341 = 1325{\cdot}8$ lbs. avoirdupois.

Problems in Practical Geometry, relative to Template Making, &c.

FIG. 1.

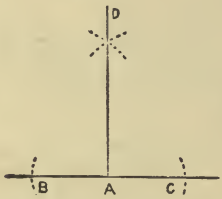
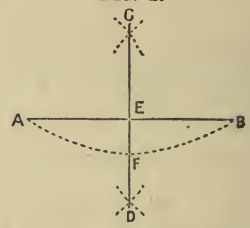


FIG. 2.



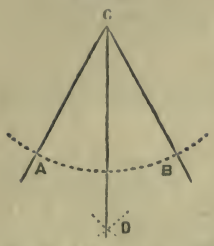
To erect a perpendicular on a given right line, from a given point in that line—Fig. 1.

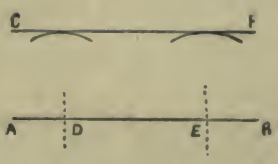
Let B C be the given line, and A the given point. From A as a centre, with any convenient radius cross the line B C with the arcs B and C; from the centres B and C, with a radius of more than half the given line, describe arcs intersecting each other in D; the line D A drawn from the intersection of the arcs D to the given point A, is the perpendicular required.

To bisect a given line—Fig. 2.

Let A B be the given line. From A B as a centre, with a radius exceeding A E, describe arcs at C and D; from B as a centre with the same radius, describe arcs intersecting the former arcs in C and D; the line C D, drawn through the points of intersection, bisects the given line A B; and should the given line be any portion of a circle, as the arc A F B, it must be bisected in like manner, the centres A and B being taken in the extremities of the arc.

Fig. 1. Fig. 2.





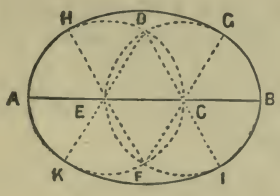
To bisect a angle—Fig. 1.

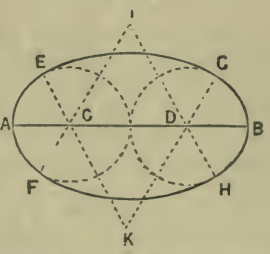
Let A B C be the given angle. From the centre C, with any radius, describe the arc A B; from A and B describe arcs intersecting each other in D; draw the line C D from the angular point C, through the point of intersection D, and the angle is bisected, or divided into two equal parts.

To draw a line parallel to a given line—Fig. 2.

Let A B be the given line. For a radius, set the compasses or trammel points to the required distance the lines are to be apart, and from any two points D and E, describe the two arcs, then draw the line C F, touching the arcs, and C F will be parallel to A B.

Fig. 1. Fig. 2.





To draw an oval of the first kind, having the length given—Fig. 1.

Divide the given length A B, into three equal parts, by means of the circles A H D C, B G D E, cutting each other in the points D and F; draw diameters of these circles from D and F: then

from F as a centre, with radius equal to F G, draw the arc H G, and from D as a centre, with radius D K, draw the arc K I, which will complete the oval.

To draw an oval of the second kind, having the length given—Fig. 2.

Divide the length A B, into four equal parts, by means of the circles A E F, G B H. Set off A E, A F equal to radius A C, and B G, B H, equal to radius B D; from the points E F G H draw lines through the centres C D, cutting each other in the points I K; and from K as a centre, with radius K E, draw the arc E G, and from I as a centre, with radius I F, draw the arc F H, and the oval will be completed.

Fig. 1.

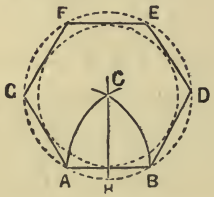
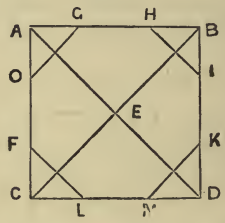


Fig. 2.



To construct a regular hexagon upon a given right line—Fig. 1.

From A B as centres, with the radius A B, describe arcs intersecting in C; on C as a centre with the same radius, describe a circle, and A B will be one side of the hexagon to be inscribed with it; carry A B six times over the circumference, and through the points of intersection draw the lines B D, D E, E F, F G, G A, and the hexagon is drawn as required.

To cut off the corners of a given square, so as to form an octagon—Fig. 2.

Let A B C D be the given square. Draw the two diagonals, bisecting each other in E; then with the distance C E, mark off from each corner of the square C O, C M, D L, D I, B K, B G, and A H, A F; lastly, draw from O to G, H to I, K to M, and L to F, and the required octagon is formed.

Fig. 1.

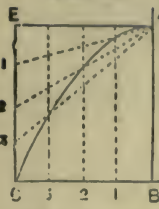
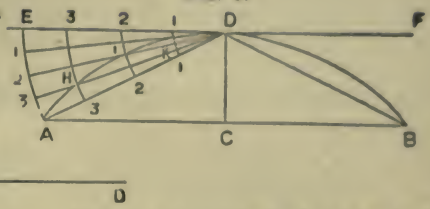


Fig. 2.



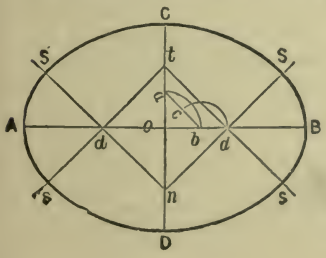
To draw a parabola by finding any number of points in the curve—Fig. 1.

Let A B be any diameter, and C D the double ordinate. Draw C E equal and parallel to A B; divide C D and C B each into the same number of equal parts, numbering both towards C; from the points 1, 2, 3, on B C, draw lines parallel to A B; and from 1, 2, 3, on E C, draw lines towards A; the points where the corresponding numbered lines intersect are in the curve of the parabola; the points for the other half of the parabola must be found in the same way.

To draw the curve line of an arc without having recourse to the centre—Fig. 2.

Let A B be the length of the cord line, and C D the versed sine or height of the arc. Join A D, B D, and through D draw E F parallel to A B; on D, with radius D A, describe the arc A E, which divide into any number of equal parts; divide D E into the same number of parts as A E, and on D as a centre, describe the arcs 3 3, 2 2, 1 1; then from the points 1, 2, 3, on the arc A E, draw lines towards D, intersecting the arcs 3 3, 2 2, 1 1, in the points H I K; through these points half of the required curve is to be traced; the other half will be found in the same manner.

To describe an ellipse, having the two diameters given—Fig. 1.



Bisect A B by a perpendicular C D, making *o* C, *o* D, each equal to half of the conjugate diameter; from *o* as a centre, with radius equal to the difference of the semi-diameters, describe the arc *a b*, and from *b* as a centre, with half the cord line *b c a*, describe the arc *c d*; then from the centre *o*, with distance *o d*,

cut the diameters in *d n* and *d t*; now draw the lines *n* S, *n* S, *t* S *t* S, then from *n* and *t*, describe the arcs S C S, S D S, also from *d* and *d*, describe the smaller arcs S A S, S B S, which will complete the ellipse as required.

To describe the template for a given diameter of Sugar Pan, of the spherical form.

FIG. 1.

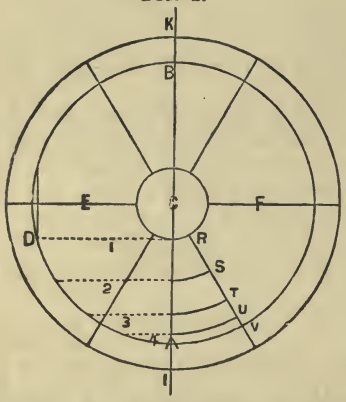
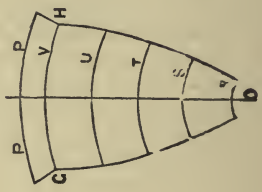


FIG. 2.

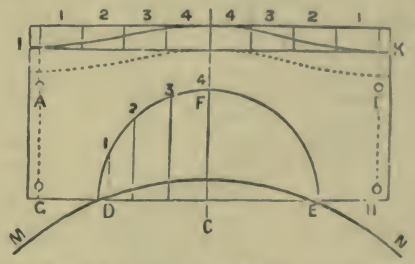


Let A B fig. 1, be the given diameter of the pan, the plates for forming the same are to be jump-jointed; the breadth and length of each plate is to bear an equal portion to the required circle.

From C as a centre, with radius of the given diameter, describe the circle A B; divide this circle into as many equal parts as it is intended to have plates in the circle of the pan. From D to A divide into any number of equal parts, say 4; then from the points of division draw lines parallel to the line E F, terminating at the line A B. Now, with C as a centre, describe the arcs R S T U V; having done this, take the sheet iron of which the template is to be made and draw a line through the centre of it, and set the trammel points to one fourth of the circumference of the given diameter, then with O as a centre, describe the arc G H, fig. 2; now take the length of D A, measuring from D to A, fig. 1, which divide into the same number of equal parts, and with O as a centre, draw the arcs as shown in the figure, and make the curved lines, R S T U V equal in length to those marked R S T U V, fig. 1; then by bend-

ing a thin lath round the points R S T U V, the curve lines of the outsides of the template may be drawn. And should the pan required to be flanged, in such case, draw the outer circle I K, to the diameter required, fig. 1, and add its portion to the top part of the template, P P, as shown in the figure, and the template will be as required.

To cut the selvage of a plate required to form a given cylinder, which is to be flanged, and made to fit a given circle.



From centre of rivet holes, let A B be one half of the circumference of the given cylinder, and M N the given circle.

On C as a centre, with radius of the given diameter of cylinder, describe the semicircle D F E; divide D F into any number of equal parts, say four, then draw lines from the points 1, 2, 3, 4, parallel to the perpendicular line C F, until they meet the line G H; now describe the given circle M N, touching the points D E, and then divide the line I K into the same number of equal parts 1, 2, 3, 4, on each side of the perpendicular line C F, measuring from the centre of rivet holes. Having done this, measure off on both sides of the line I K, the heights 1, 2, 3, 4, which stand between the lines D C, and through the points of intersection trace the curved lines required. The other half of the circumference must be described in the same manner, and the selvage of both plates, which are to form the cylinder, will be completed.

TABLE XXXVI.

Strength of Steel and Iron.

The cohesive strength of a bar of steel or iron is that force with which it resists being torn asunder when pulled lengthwise, and the strength of a bar exposed to strains in the direction of its length, is in proportion to the transverse area, whatever be its figure, length, or position.

Table showing the cohesive strength of steel and iron bars. One-third of the ultimate strength is always considered sufficient for a permanent load.

MATERIAL.	The strength of 1 inch Square Bar.	One-Third the strength.	The strength of 1 inch Round Bar.	One-Third the strength.
	Lbs.	Lbs.	Lbs.	Lbs.
English Iron, 1st quality	66900·	22300·	52544·	17514·
,, ,, 2nd quality	55872·	18724·	43881·	14627·
Welsh Iron, 1st quality	64960·	21653·	51018·	17006·
,, ,, 2nd quality...	55776·	18792·	42806·	14268·
Swedish Iron	72064·	24021·	56599·	18866·
Cast Steel	134256·	44752·	105444·	35148·
Blister Steel	133152·	44384·	104577·	34859·
Shear Steel	124400·	41466·	97703·	32567·

To find the ultimate cohesive strength of square, flat, and round bars.

RULE.—Multiply the area of section of the bar in inches and parts, by the tabular number required, and the product will be the ultimate cohesive strength.

EXAMPLES.

A bar of English Iron, 2nd quality, being $1\frac{1}{2}$ inches square, what is its cohesive power, or absolute strength?

$1{\cdot}5 \times 1{\cdot}5 = 2{\cdot}25 \times 55872 = 125712$ lbs. =Ans.

Required the ultimate strength of a bar of round iron, 2nd quality, $1\frac{1}{2}$ inches in diameter.

$1{\cdot}5 \times 1{\cdot}5 = 2{\cdot}25 \times 43881 = 98732\frac{1}{4}$ lbs. =Ans.

NOTE.—The diameter of a circle multiplied by ·8862 equals the side of an equal square—and the side of a square multiplied by 1·128 equals the diameter of an equal circle.

EXAMPLES.

The diameter of a circle is $1\frac{3}{4}$ in. what is the side of square equal in area to the given diameter?

$1{\cdot}75 \times {\cdot}8862 = 1{\cdot}55 = 1\frac{9}{16}$ in. nearly. =Ans.

The side of a square being $1\frac{9}{16}$ inch, what will be the diameter of circle equal in area to the given square

$1{\cdot}5625 \times 1{\cdot}128 = 1{\cdot}76 = 1\frac{3}{4}$ in. nearly. =Ans.

TABLE XXXVII.

Containing the fractional parts of an inch, when divided into thirty-two parts; also a foot of twelve inches reduced to decimals.

Decimals.	Parts of an Inch.	Decimals.	Parts of an Inch.	Decimals.	Parts of a Foot.
·03125	equal to $\frac{1}{32}$	·5	equal to $\frac{1}{2}$	·0833	equal to 1 inch
·0625	,, $\frac{1}{16}$	·53125	,, $\frac{17}{32}$	·1666	,, 2 ,,
·09375	,, $\frac{3}{32}$	·5625	,, $\frac{9}{16}$	·25	,, 3 ,,
·125	,, $\frac{1}{8}$	·59375	,, $\frac{19}{32}$	·3333	,, 4 ,,
·15625	,, $\frac{5}{32}$	·625	,, $\frac{5}{8}$	·4166	,, 5 ,,
·1875	,, $\frac{3}{16}$	·65625	,, $\frac{21}{32}$	·5	,, 6 ,,
·21875	,, $\frac{7}{32}$	·6875	,, $\frac{11}{16}$	·5833	,, 7 ,,
·25	,, $\frac{1}{4}$	·71875	,, $\frac{23}{32}$	·6666	,, 8 ,,
·28125	,, $\frac{9}{32}$	·75	,, $\frac{3}{4}$	·75	,, 9 ,,
·3125	,, $\frac{5}{16}$	·78125	,, $\frac{25}{32}$	·8333	,, 10 ,,
·34375	,, $\frac{11}{32}$	·8125	,, $\frac{13}{16}$	·9166	,, 11 ,,
·375	,, $\frac{3}{8}$	·84375	,, $\frac{27}{32}$	·010416	,, $\frac{1}{8}$ of in.
·40625	,, $\frac{13}{32}$	·875	,, $\frac{7}{8}$	·02083	,, $\frac{1}{4}$,,
·4375	,, $\frac{7}{16}$	·90625	,, $\frac{29}{32}$	·03125	,, $\frac{3}{8}$,,
·46875	,, $\frac{15}{32}$	·9375	,, $\frac{15}{16}$	·04166	,, $\frac{1}{2}$,,
		·96875	,, $\frac{31}{32}$	·052083	,, $\frac{5}{8}$,,
				·0625	,, $\frac{3}{4}$,,
				·072916	,, $\frac{7}{8}$,,

The above table is to facilitate the multiplication and division of parts f an inch, and other calculations. For example, suppose a plate of ron to measure $48\frac{1}{2}$ inches long, $18\frac{3}{4}$ inches broad, and $\frac{1}{4}$ of an inch hick, what number of cubic inches will it contain?

EXAMPLE.

```
   48·5=48½
  18·75=18¾
  ------
   2425
  3395
 3880
 485
 ------
 909·375
```

```
  909·375
     ·25=¼
 -------
 4546875
 1818750
 -------
227·34375=cubic inches=Ans.
```

Tempering Steel Tools.

For Cast Iron.—For boring cylinders, turning rolls, or any large cast iron, let the tools be as hard as clean water will make them, minding not to heat the steel more than cherry-red.

For Wrought Iron.—Large tools for turning and boring, to be heated to cherry-red, and let down to a pale straw colour, and small tools a shade darker.

Screw-Dies, Plates, Taps, &c.—To be heated to cherry-red, and tempered to a very dark straw colour.

Large Rimers, and Steeled Iron Taps.—To be heated uniformly to a cherry-red, and dipped in a cistern containing warm water of about 80 degrees Fahrenheit; in this case they will require no letting down—always bearing in mind to dip the large end of the rimer in the water first, this will give a uniformity of hardness.

For Small Rimers, &c.—Let them be heated to cherry-red and tempered to yellow, slightly tinged with purple.

For Shears and Punches.—Heat them to cherry-red and dip them in clean cold water, and temper them to the colour of a light purple.

Tools for Cutting Wood—Heat them to cherry-red very carefully, and dip them in warm water, of about 30 degrees Fahrenheit, then temper them to a dark straw colour.

Case Hardening.

The most common plan for case hardening consists in the insertion of the articles among horn or leather cuttings, bone dust, or animal charcoal, in an iron box provided with a lid luted with clay, which is then put into a furnace for a period answerable to the depth of steel required, after this the box is taken from the furnace and its contents suddenly immersed in cold water.

Many articles may be case hardened by prussiate of potash.

Take prussiate of potash and pound it to a fine powder, then heat the article to a dull red heat, and sprinkle upon it sufficient of the prussiate of potash, then return it to the fire for a minute or so, and finally immerse in water till cold.

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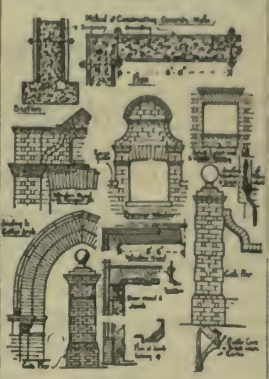

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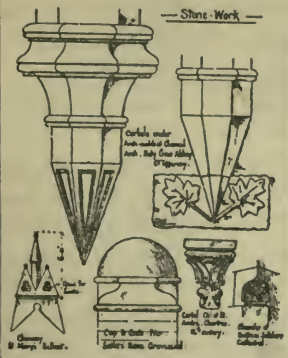

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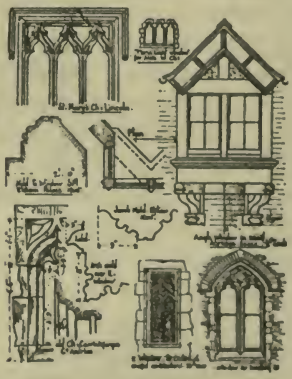

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